

SUPPLEMENT.

The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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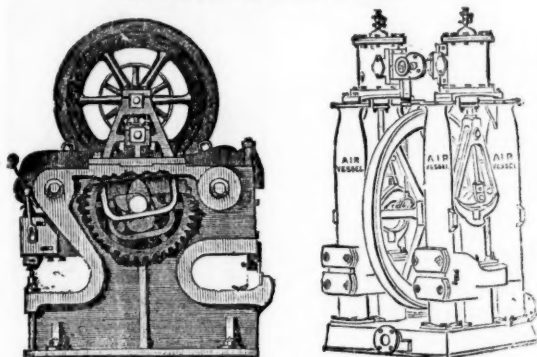
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LONDON, SATURDAY, FEBRUARY 23, 1878.

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fitted complete; Patent Hemp and Manila Hawse, Warps, Corlages, Spun-yarn,
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PARIS,
BRONZE MEDAL, 1867.



ORDER OF THE CROWN OF PRUSSIA.



FALMOUTH,
SILVER MEDAL, 1867

A DIPLOMA—HIGHEST OF ALL AWARDS—given by the
Geographical Congress, Paris, 1875—M. Favre, Contractor, having
exhibited the McKean Drill alone as the MODEL BORING MACHINE
for the ST. GOTHARD TUNNEL.

SILVER MEDAL of the Highland and West of Scotland
Agricultural Society, 1875—HIGHEST AWARD.

At the south end of the St. Gothard Tunnel, where

THE MCKEAN ROCK DRILLS

Are exclusively used, the advance made during eight consecu-
tive weeks, ending February 7, was 24'90, 27'60, 24'80, 26'10,
28'30, 27'10, 28'40, 28'70 metres. Total advance of south head-
ing during January was 121'30 metres, or 133 yards.

In a series of comparative trials made at the St. Gothard Tun-
nel, the McKean Rock Drill continued to work until the pres-
sure was reduced to one-half atmosphere ($7\frac{1}{2}$ lbs.), showing
almost the entire motive force to be available for the blow
against the rock—a result of itself indicating many advantages.

The GREAT WESTERN RAILWAY has adopted these
Machines for the SEVERN TUNNEL; the LONDON AND
NORTH-WESTERN RAILWAY for the FESTINIOG TUN-
NEL; and the BRITISH GOVERNMENT for several Public
Works. A considerable number of Mining Companies are now
using them. Shafts and Galleries are driven at from three to
six times the speed of hand labour, according to the size and
number of machines employed, and with important saving in
cost. The ratio of advantage over hand labour is greatest
where the rock is hardest.

These Machines possess many advantages, which give them
a value unapproached by any other system of Boring Machine.

THE MCKEAN ROCK DRILL IS ATTAINING GENERAL
USE THROUGHOUT THE WORLD FOR MINING, TUN-
NELLING, QUARRYING, AND SUB-MARINE BORING.

The MCKEAN ROCK DRILLS are the most powerful—the
most portable—the most durable—the most compact—of the
best mechanical devices. They contain the fewest parts—have
no weak parts—act without SHOCK upon any of the operat-
ing parts—work with a lower pressure than any other Rock
Drill—may be worked at a higher pressure than any other
—may be run with safety to FIFTEEN HUNDRED STROKES
PER MINUTE—do not require a mechanic to work them—are
the smallest, shortest, and lightest of all machines—will give
the longest feed without change of tool—work with long or
short stroke at pleasure of operator.

The SAME Machine may be used for sinking, drifting, or
open work. Their working parts are best protected against
grit and accidents. The various methods of mounting them
are the most efficient.

N.B.—Correspondents should state particulars as to
character of work in hand in writing us for information,
on receipt of which a special definite answer, with
reference to our full illustrated catalogue, will be sent.

PORTABLE BOILERS, AIR COMPRESSORS, BORING STEEL,
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LONDON: 52, QUEEN VICTORIA STREET, E.C.

IMPORTANT NOTICE TO MINE PROPRIETORS.

MR. GEORGE GREEN, ENGINEER, ABERYSTWITTH
SUPPLIES MACHINES under the above Company's Patents to
DRESSING all METALLIC ORES. Dressing-floors having these Machines pos-
sess the following advantages:—

- 1.—THEY ARE CHEAPER THAN ANY OTHER KIND IN FIRST OUTLAY.
- 2.—ONLY ABOUT ONE-FOURTH OF THE SPACE USUALLY OCCUPIED
BY DRESSING-FLOORS IS REQUIRED.
- 3.—FROM 60 TO 70 PER CENT. OF THE LABOUR IN DRESSING, AND
FROM 5 TO 10 PER CENT. OF ORE OTHERWISE LOST, IS SAVED.
- 4.—THEY ARE THE ONLY MACHINES THAT MAKE THE ORE CLEAN
FOR MARKET AT ONE OPERATION.

They have been supplied to some of the principal mines in the United Kingdom
and abroad—viz.,

The Greenside Mines, Patterdale, Cumberland; London Lead Company's Mines,
Darlington, Colberry, Nanthead, and Bollyhope; the Stonecroft and Greyside
Mines, Hexham, Northumberland; Wanlockhead Mines, Abington, Scotland (the
Duke of Buccleuch's); Bewick Partners, Haydon Bridge; the Old Darren, Esqair-
myn, and Yattummen Mines, in Cardiganshire; Mr. Beaumont's W.B. Mines,
Darlington; also Mr. Sewell, for Argenteiferous Copper Mines, Peru; the Bra-
berg Copper Mines, Norway, and Mines in Italy, Germany, United States of
America, and Australia, from all of whom certificates of the complete efficiency of
the system can be had.

WASTE HEAPS, consisting of refuse chads and skimpings of a
former washing, containing a mixture of lead, blende, and sulphur,
DRESSED TO A PROFIT.

Mr. BAINBRIDGE, C.E., of the London Company's Mines, Middleton-
in-Teesdale, by Darlington, writing on the 20th March, 1876, says—"The yearly
profit on our Nanthead waste heaps amounted last year to £600, besides the ma-
chinery being occupied for some months in dressing ore-stuff from the mines. Of
course, if it had been wholly engaged in dressing wastes our returns would have
been greater; but it is giving us every satisfaction, and bringing the waste heaps
into profitable use, which would otherwise remain dormant."

Mr. T. B. STEWART, Manager of the Duke of Buccleuch's Mines,
Wanlockhead, Abington, N.B., writing on 20th March, 1876, says—"I have much
pleasure in stating that a full and superior set of your Ore Dressing Machinery has
been at work at these mines for fully a month, and each day as the moving parts
become smoother, and those in charge understand the working of the machinery
better, it gives increasing satisfaction, the ore being dressed more quickly, cheaply,
and satisfactorily than by any other method."

Mr. BAINBRIDGE, speaking of machinery supplied Colberry Mines,
says—"Your machinery saves fully one-half on old wages, and vastly more on the
wages we have now to pay. Over and above the saving in cost is the saving in ore,
which is a great short of 10 per cent."

GREENSIDE MINE COMPANY, Patterdale, near Penrith, say—"The
separation which they make is complete."

Mr. MONTAGUE BEALE says—"It will separate ore, however close
the mechanical mixture, in such a way as no other machines can do."

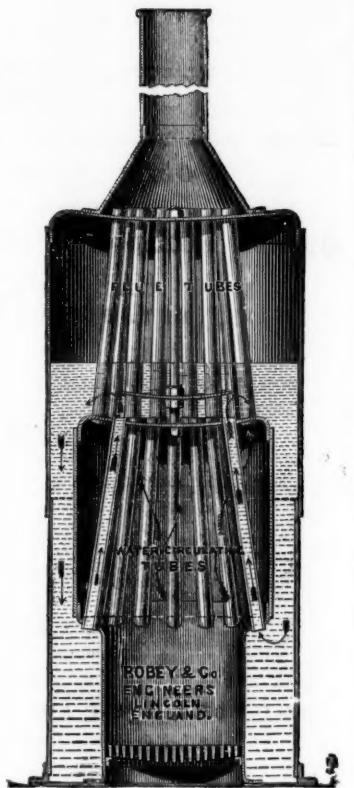
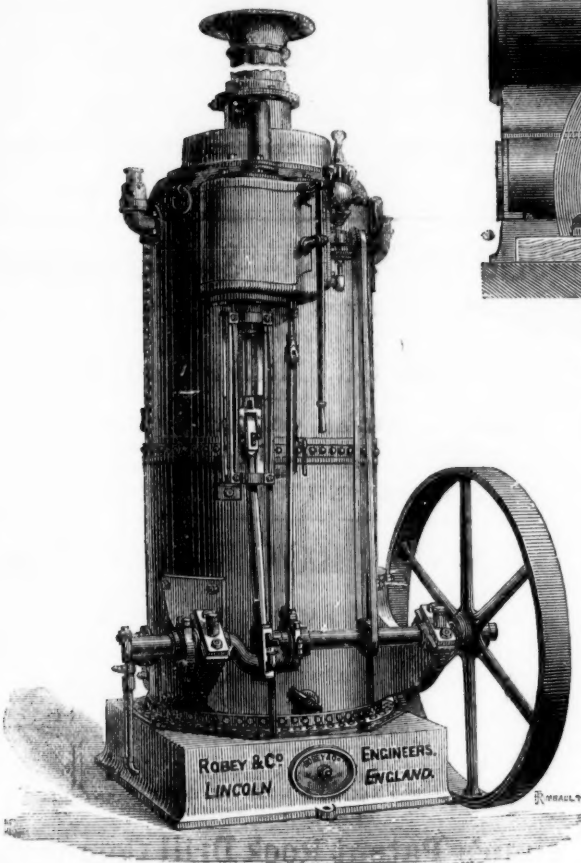
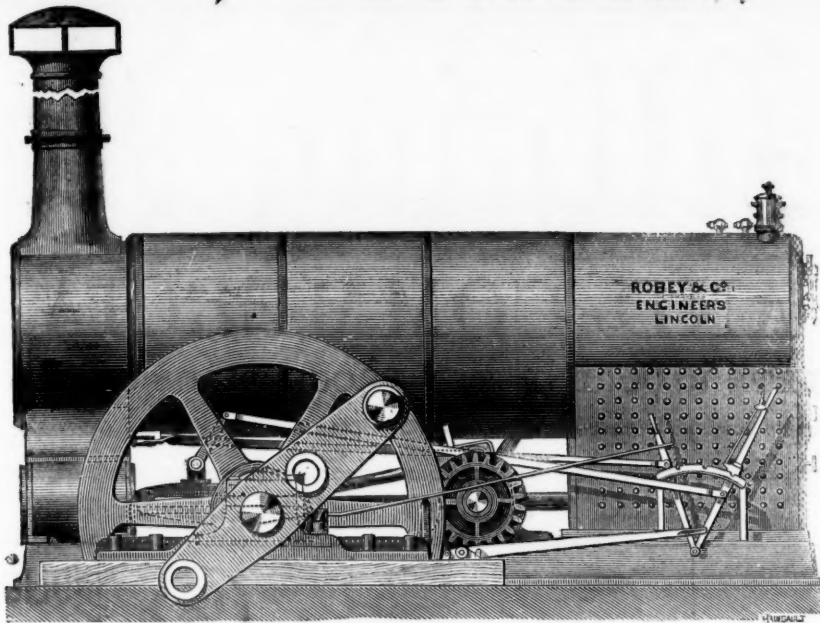
Mr. C. DODSWORTH says—"It is the very best for the purpose,
and will do for any kind of metallic ores—the very thing so long needed for dress-
ing-floors."

Drawings, specifications, and estimates will be forwarded on application to—
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Some of the advantages of this Engine are—

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SAFETY, AND ECONOMY IN WORKING; GREAT SAVING IN FUEL.

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Improved Vertical Steam Engines and Patent Boilers combined.

The Illustrations show one of Robey and Co.'s Improved Vertical Engines. All these Engines are supplied with R. and Co.'s New Patent Boiler, as per section illustrated, which has, among others, the following advantages over all Vertical Boilers yet introduced:—

PERFECT CIRCULATION OF THE WATER; SEPARATION OF THE SEDIMENT;
GREAT DURABILITY; GREAT ECONOMY IN FUEL.

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THE UNION ENGINEERING COMPANY (C. SCHIELE AND CO.) undertake the Construction and Erection of their Colliery Ventilation Fans, of all sizes up to the largest required quantities of air. The leading features of their system are now generally known. Some of the specialities are: The absence of neo safety for costly erections in masonry and brickwork; the small space required for the Machines, and the moderate first cost of the whole.

As the Fans are in a great measure self-contained, the necessary seats and connection with Pit are of a simple and inexpensive character. They can be arranged to be placed below ground when required, and also to work on

Drawing Shafts. Certain sizes are often used to assist in Furnaces, with good effect.

[Estimates and further information will be prepared on receipt of the necessary particulars.]

FOR SINKING PURPOSES, and also for places where small quantities of air are needed for Ventilating purposes, a Special Fan is made, in various sizes, with small engine combined, complete, arranged for both forcing and exhausting air.

NOISELESS BLOWING FANS, for Smithy Fires, and other purposes.

TURBINE WATER-WHEELS, specially designed and adapted for use in Coal Mines, for high falls of water, for the purpose of developing water power, where it is available, for use in hauling, pumping, and other works.

The Firm, having had an experience of nearly twenty-five years exclusively in the above Special Departments of Engineering, are prepared to advise on any matter affecting the application of Fans or Water Power in Collieries or elsewhere.

COAL-CUTTING MACHINERY, WINDING, HAULING, AND OTHER DESCRIPTIONS OF STEAM-ENGINES.

THE UNION ENGINEERING COMPANY (C. SCHIELE & CO.),
PNEUMATIC AND HYDRAULIC ENGINEERS,

(SOLE PROPRIETORS AND MAKERS OF SCHIELE'S LATEST PATENTS).

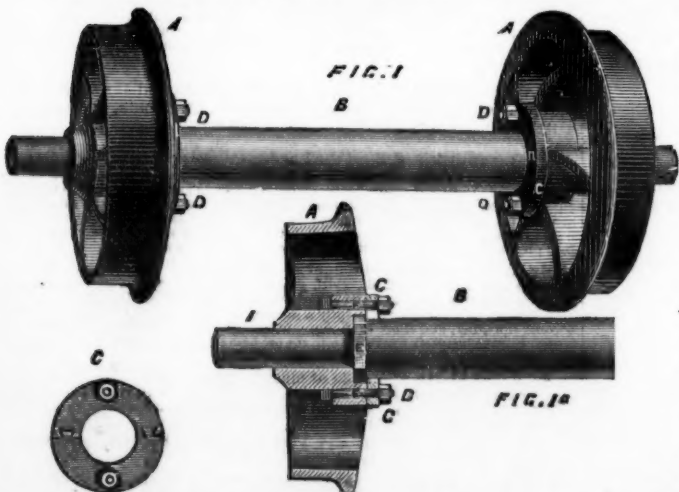
2 CLARENCE BUILDINGS, BOOTH STREET, MANCHESTER.

JOSEPH FENTON & SONS, SYKES WORKS, SHEFFIELD, and 118, Cannon-street, LONDON, E.C., MANUFACTURERS OF

CRUCIBLE CAST STEEL CASTINGS,

HAVE PLEASURE IN CALLING THE ATTENTION OF THE MINING WORLD TO THEIR

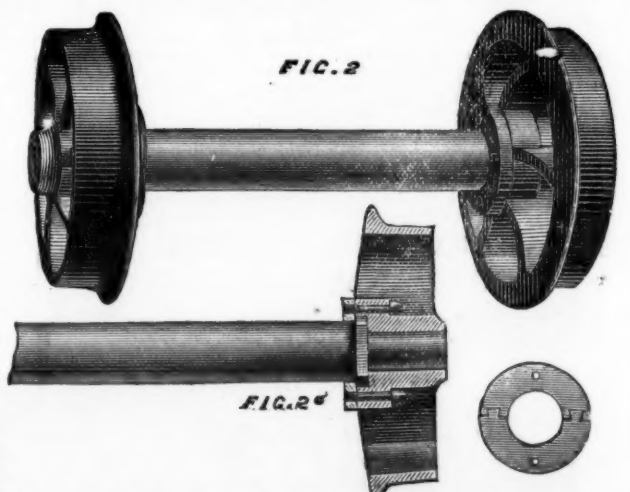
Patent Method of Fitting up Cast Steel Wheels and Axles.



Figs. 1 and 1a show a longitudinal view and plan of a pair of corf wheels and axles fitted up for outside bearings. A A are the wheels; B, is the axle; C C, the washers; D D, the bolts; E, the collar on axle B; and F, the recessed boss in the wheel.

The wheel is cast with a recessed boss in the inside, made to any shape, corresponding in shape and depth with a collar formed on the axle. Figs. 2 and 2a show a longitudinal view and plan of a pair of corf wheels fitted up for inside bearings. The washers are secured to the boss of the wheel in outside bearings by bolts and nuts, and in inside bearings by set screws.

The advantages of the above system are:—A, the singular simplicity of fitting—enabling any inexperienced person, with the aid of a spanner or screw-driver, to detach the wheels from the axle or fit them together in a very short time. B, perfect solidity, the wheels and axles becoming as one piece. C, durability, no need of putting the wheels or axles into the fire, under any circumstances, which is so detrimental to wheels, rendering them remarkably brittle, and which under other systems are detached from the axle by the aid of fire. D, economy in fuel and wages, saving hundreds of pounds yearly to large coal owners. The



important desiderata secured by this invention of simplicity (so often wanted in patents), solidity, durability, and economy, have not only been amply illustrated by the technical journals interested in the progress of mining operations in this country, but have at once been fully recognised by leading authorities in the mining world.

Original Correspondence.

CITY IMPROVEMENTS—ACQUISITION OF FIFTY MILLION POUNDS BY THE CORPORATION, THROUGH THEIR SUPPLYING LONDON WITH COAL.

SIR,—I beg leave to submit the following means of increasing the corporate revenue to the extent of 2,000,000 sterling per annum. Mr. J. R. Scott's return of 1877 coal import into the Metropolis is, as per annexed document, 8,591,682 tons, which, by the system proposed in enclosed excerpt from the *Mining Journal* of Jan. 26 and Feb. 2, "The London Coal Supply," can be delivered (say), household coal into consumers' premises at a saving of 9s. per ton as compared with railway transport, and 6s. 11d. per ton as compared with sea; freight from Tyne, Wear, and Hartlepool 6s. 2d. per ton on gas coals, by rail 8s. 11d. per ton. The rate of conveyance by rail alone is 140 to 180 per cent. of the prime cost of the coal at pit. Any analogy with the meat supply is not in the most distant degree applicable, as the transport of live stock or dead meat involves a *minime* or very trifling proportion of the aggregate cost, whilst it is wholly irrelevant to allude to the bread supply. As to the Great Northern Railway Company, at one period dealing in coal, many interests were involved, which is totally different with the Corporation of London deriving a not unimportant revenue from coal. I am desirous of avoiding prolixity. The Metropolitan Board of Works and provincial corporations have taken, and are engaged in taking, into their own hands the water and gas works in their respective localities. Coal is of immense consumption in the Metropolitan production of gas, as well as an important auxiliary in the water supply of the Metropolis. In the actual state of old and modern London gigantic and urgent improvements are held in abeyance. By the Corporation taking the coal supply into their hands they can ensure the equivalent of a capital of 50,000,000 sterling.

The necessary *matériel* of steamers, &c., to convey and deliver 8½ million tons of coal per annum will involve an outlay of 2½ million pounds, upon which, after deductions made of insurance, repairs, amortisation or depreciation, port charges and pilotage, fuel, wages, oil, tallow, and contingencies, a profit arises as predicted; but with only 5s. per ton 2,000,000 per annum profit can be realised, all working expenses, management, and 10 per cent. interest on outlay of capital included.

I hold myself at your absolute disposal, with the most elaborate data, should this meet with consideration, which proposal I have not presumed to lay before the Corporation without previous consultation with Corporation officials, &c., which I deem, in justification of my *demarche*, quite necessary to name. May I be permitted to add that petitions from millions of the inhabitants of London in favour and support of the Corporation adopting the proposed measure will be forthcoming? I have the honour to reiterate the expression of my highest consideration,

WILLIAM JOSEPH THOMPSON,
Russian Consul for upwards of 25 years for North and South Shields and district, the largest export ports of coals in Great Britain.
20, Little Tower-street, E.C., Feb. 21.

MINING IN NEW SOUTH WALES.

SIR,—In consequence of the Land Mania of the last twelve months very little attention has been given to mining affairs, except by the working miners themselves, and the few far-sighted Sydney capitalists who have sense enough to know that mining, like every other real business, must be properly and persistently carried out, and that then the reward is tolerably sure.

COAL.—The demand is still on the increase, and as several of the old and well known mines nearest to Newcastle are now nearly worked out, capitalists and speculators are beginning to look to the unworked country—about 8 or 10 miles from the port—adjoining the Wallsend Company, and extending to back of Lake Macquarie, as the trend and dip of the Wallsend seam is known to be that way, and the discovery lately of a hitherto unknown 16-ft. seam near the surface gives a great additional value to the few thousand acres of level country between the lake and the ranges. The southern mines at Bulli and Wallongong are also fully employed (steam coal only from this district), and the shares in all coal companies are at high premiums, and eagerly sought after.

IRON.—It is said (?) the Fitzroy Company, on the Southern Railway, have really at last got coal that can be used; if so, the ore is rich enough, and plentiful also. The Wallerawang Iron and Coal (4000 acres) on the Western Line still remains unworked, although according to the report of Prof. Liversedge, with the various kinds of ore, the two or three different seams of coal, the fire-clays, &c., and its nearness to the railway and to Sydney, it ought to be one of the most valuable properties of its kind to be found anywhere.

COPPER.—Most of the old mines are steadily working on, and the almost daily extension of our railways helps the poorer ones wonderfully, as there is always a certain market now for their ores or regulus at the Emu or Eskbank smelting-works, which, being erected where the coalpits are adjoining the line, enables all the small coal to be utilised. The two most notable successes are Ben-susan's Frogmoor Mine (managed now by Capt. Eddy, who was, I think, the gentleman who was sent to America to examine the celebrated Emma Mine); and still more especially the Snowball Mine, near Gundagai, where the lode is from 8 to 11 ft. thick, sunk on by four several shafts, to a depth of from 70 to 140 ft., and proved to extend for over 1000 ft. in length, with strong surface indications of the lode for over a mile. It has been developed, so far, entirely by private enterprise. Mr. John Sturt having prospected and opened up the first shaft, and laid out all the works, with the monetary aid of Mr. Peterson, of the Hill End Gold Mines, and being now still farther backed up by Sydney capitalists, who bought a half interest for a very high figure, and are now expending 50000. in additional furnaces and plant. The returns already are both large and regular, and this success will give a great impetus to mining all round the district, especially as the Southern Railway will soon be within forty miles of it. It will, also, probably lead to the opening up of the Mingrey lodes, about three miles away, which outcrop for over a mile, and have already attracted the attention of our Victorian neighbours.

TIN.—All the "sham" companies are now defunct, and most of the claims are in private hands, and paying good dividends, and some of them even splendid ones. When our Northern Railway reaches the district, so that carriage is cheapened and directors can visit the property, there are thousands of acres which will pay well for capitalist companies, as the mines worked at present are only those where Nature does most all the work, in the shape of good water supply, easy roads, &c., whilst land, probably more permanent and richer, is left idle for want of 10,0000. of certain available capital, to cut races and bring water from a distance, &c. Some really good lodes have been found, but are not likely to be worked whilst the alluvial holds out.

GOLD.—Hill End Mines are only paying expenses; and, with one or two exceptions, the Adelone ones are doing much about the same, but both places are (at last) following the example of Victoria, and going in for deep sinking, and shareholders instead of clamouring for a small dividend every few weeks are now wise enough to let the profits be expended in properly opening up their property, so as to secure a continuous and profitable return eventually. Had our mines been started on this principle there are certainly scores, and probably hundreds, of "abandoned" claims, which now would have been as good as annuities to the workers, for all experience—both in Victoria, Queensland, and America—seems to prove that the gold "goes down," and in many cases grows richer with depth.

ALLUVIAL.—The most noticeable item in this is Newman's claim, at Araluen, where, after years of unbroken effort, he has succeeded at last in draining his workings, by means of an underground race over a mile long, and as this saves not only pumping expenses but also continuous delays, he now makes a profit on all stuff which gives over 5 grains to the load. Seeing is believing, and all the old hand-to-mouth school who laughed at his new-fangled ideas begin now to see how to do it also, and his success will inaugurate

a new era in sluicing, not only in the valley, but in scores of other places of like formation.

In conclusion, mining is now really becoming a more settled industry, and the principal cause is the sudden opening up of the country by our new railways, and the being able to visit spots in a few hours with comfort or certainty which used to take days of misery and discomfort, and which were, therefore, never visited at all by the men who found the means, until it was too late to check the persons who mispent the funds and misstated the prospects.

Sydney, N.S.W., Dec. 21.

R. D. ADAMS.

PS.—Our colony will make a creditable display of its mineral resources at the Paris Exhibition, and as one of our representative commissioners—Prof. Liversedge—has personally visited many of our mining districts, he will be able to give reliable information to those visitors who take an interest in such matters.

R. D. A.

MINING IN NEW SOUTH WALES.

SIR,—... I have a good opinion of this district (Frogmoor). Indeed, I have never seen a finer belt of country for the production of copper; all that is wanted is some capital, and cheaper labour. If the Government were to spend a few thousands in prospecting and import mining emigrants, I believe a second Cornwall would soon be found, but wages must get lower, and emigration and plenty of work can only do it. In Cornwall at the present time more work is done for 10s. than here for 20s., but if your smart legislators in Sydney had a little more common-sense, less talk and some practical energy, this colony would "lick" the world. I can give you an instance on emigration. Five men and their families, altogether numbering 23, arrived here from Cornwall. They came over as emigrants; they say the trip was like a pleasure trip, and it has only cost them about 50. per man to reach this place; they now earn three times higher wages for less work than they did in Cornwall, and here they pay no rent, taxes, &c., and beef is 3½d. instead of 9d. per lb.; flour and other commodities just as cheap as in Cornwall.

My experience in copper mining in New South Wales is limited, but I have seen nothing yet to induce me to say that copper lodes will not continue rich in depth. I am now sinking a shaft about 150 ft. below the surface, and I never saw a better well-defined lode, or a lode the matrix of which was more congenial for producing copper. The lode averages 4 ft. in width, composed chiefly of quartz, iron, and copper pyrites, and worth for the latter for the portion I have broken about 500. per fathom. I believe there are numerous lodes in the district rich in copper, but unless the lodes show rich carbonates cropping out above the surface no prospecting is done. All copper mining that I have seen in New South Wales has been carried on similar to the old men's works at home some hundred years ago. I do not know of a copper lode in either of the colonies that has been tested any depth and failed, I know where money has been squandered on surface erections. I believe that copper mining with cheaper labour and modern improvements in machinery for winding, pumping, and dressing, to be safe for investment of capital, and that New South Wales will yet become a great copper producing colony.—*Burrova*, Nov. 29.

WM. EDDY.

PACIFIC COAST CORRESPONDENCE—RICHMOND MINING COMPANY.

SIR,—As a resident of the Pacific Coast and a Richmond shareholder, I ask that you extend to me the courtesy usually accorded to the correspondents of your impartial and widely-circulated journal.

Pacific Coast holders of Richmond, though not a few, have not been, nor are they even now, when their interests most demand it, much given to fault-finding, making useless complaints, penning caustic criticisms, or of sounding the praises of this or that officer of the company. An honest and efficient officer should never be lightly spoken of, nor should there be any obstacles, however trivial, thrown in the way to retard his actions, or to prevent him from discharging his obligations to the company in a proper and thoroughly conscientious manner. But, while I am in favour of extending every encouragement to a good and capable officer—be he either superintendent, secretary, foreman, or managing director—I am equally in favour of removing from his position every man holding a prominent place in the employ of the company, who is not *en rapport* with the majority of the shareholders, or whose presence is more hurtful than serviceable to their interests. I am not over given, nor am I anxious, to figure very conspicuously in a newspaper controversy; but when I do, or when I deem that my interests or the cause of truth demands it, I generally speak that which I know to be susceptible of direct proof, irrespective of consequences. Although I have for some time back been aware of the facts upon which this letter is based, I have withheld them from my fellow-shareholders, and it is likely that they should not even now be given to them through the Journal had I not been influenced to do so by a rather interesting communication over the signature of your occasional Pacific correspondent, J. D. Power, which appeared in the *Mining Journal* of Nov. 12, and to which my attention was directed subsequent to my arrival here direct from your city last December. Mr. Power, though reputed a truthful and cautious writer, has in the letter in question exhibited, to my mind, an utter disregard for public opinion, or for the facts upon which it is founded. That he is an admirer of the company's managing director, Mr. Probert, is certain from the extravagant way in which he eulogises that gentleman, I am not aware from all that I have heard or can learn that he has any very good cause for his partiality for Mr. Probert, or for holding him up to shareholders as a model of managerial or executive perfection. But it matters very little whether he has or has not; I, for one, as do many other prominent and influential gentlemen resident both here and at the company's property, question the soundness of his views in relation to the perfection and qualifications which he claims as possessed by his friend Mr. Probert.

Although not claiming a personal acquaintance with the latter, whom I have frequently met in this city, I have, however, heard enough about him recently to convince me and every fair-minded man who possessed a knowledge of the facts to which I am about to allude that he is not the right man in the right place, neither at this juncture nor has he been at any other time since he was appointed managing director of the Richmond Company in this country. This is a plain proposition, and I now unhesitatingly challenge any man who has for the past four years watched his career, and took note of his management of the Richmond affairs, to disprove it. Will the forthcoming report of the Commission disprove it? I opine not, in the face of the proofs gathered while here and at Eureka. Will his past administration of the company's concerns disprove his unfitness for his position?—Hardly. Will both his bearing and business relations with the people of Eureka entitle him to the praise of being either a practical, a wise, or a careful business man?—I think not; and the sooner these facts are known to the English stockholders the better it will be for their interests. A man filling the high social and official position now occupied by this gentleman should be a gentleman, and should exemplify his claims to it in his relations with everyone with whom he is brought into contact having business or other relations with the company—polite, courteous, and urbane to all, irrespective of class or station, entertaining no prejudices and making no antagonisms that would work an injury to his company, or help to retard its prosperity. This gentleman during the past four or five years has exercised almost absolute control over one of the finest and, as the sequel has shown, one of the most productive mining properties owned by English capitalists in America. And, let me ask, what are the results that have accrued to them from his long incumbency—from his unprofitable management? Simply that the mine has through this series of years paid them in dividends the insignificant total of 31. 16s. 6d. per share. Is the Eureka Consolidated property, adjoining on the same ore channel, possessed of any greater merits as an ore-producer than is the Richmond?—Certainly not; nor does it at the present time at least, if report is to be credited, possess yielding qualities equal to the latter. Why, then, should the difference in dividend disbursements be in favour of the former to the extent of several thousand dollars paid upon its capital stock?

This company is now and has been ever since the termination of the late disastrous, and I might add impolitic, lawsuit declaring

and paying monthly dividends of \$3 per share—aggregating \$150,000 per month—while the Richmond shareholders have to be content with a paltry 7s. 6d. per share once in every three months, as recently foreshadowed by the directors would henceforth be paid. Now, what do all these things prove? They prove very conclusively, if they prove anything at all, that Mr. Probert's management is a failure—so bald and palpable that he ought to be requested to step down and out, and make way for some more capable and experienced man. Surely there can be found among the great body of intelligent business men who compose the Richmond shareholders the peer, or rather the superior, of the present managing director in point of business experience, judgment, and mining qualifications, who could be influenced to become his successor.

But I question very much whether the presence of such an official here, or rather at the mine, is essentially necessary to the well-being of the company in connection with an intelligent and practical mining superintendent, such as the present incumbent of that position is reputed to be.

But the latter question is one for the directors and shareholders to determine. For my own part, I fail to discover a single reason that would entitle Mr. Probert to become the recipient of a longer continuance of the confidence of the Richmond shareholders. Mr. Power, viewing things from his extensive stand-point with more confidence than modesty, alleges that "much of the present prosperity of the company is attributable solely to the vigilance, ability, and practical mind of the managing director." This is all very well in its way; but neither the way nor the allegations made will stand the test of impartial scrutiny, and there is no man that ought to know those things better than the eulogist of Mr. Probert. Upon what hypothesis does he base his assumptions—for assumptions they are, and nothing more. Does he suppose that the shareholders and other friends of the Richmond resident on this Coast, though heretofore silent, have been blind to the imperfections of Mr. Probert, or disinterested observers of his management and official acts? Moreover, he must be aware, if he is aware of anything, that the administrative abilities of Mr. Probert are not above, and hardly up to, a mediocre standard. An able and careful business manager would hardly have cared to shoulder the great responsibility of having precipitated the late disastrous lawsuit with the Eureka Consolidated Company. This he has done, and with him now lies the onus of proving that the step he took was dictated by either judgment, experience, or prudence. A prudent and clear-headed business man would, under the circumstances, have hesitated before he committed the company to so unwise a course as he did. Had he first tried compromise measures and failed he would be right to have proceeded as he did. But this he did not do; hence the company has to bear the burden entailed upon it by that unparalleled blunder. Common sense, if nothing else, would have first dictated this procedure, and it is to the lack of this essential to success in almost any sphere of life, as well as to his want of a proper knowledge of the local and national mining laws and to inattention to their commonest requirements, that the shareholders are now indebted for the condition in which they find themselves with an unsettled lawsuit, like the sword of Damocles, hanging threateningly above their heads. Mr. Probert must have known that at the termination of the Look-Out lawsuit, in 1874, a clearly-defined compromise line, extending to an indefinite depth, had been established between the two companies, and that this easterly and westerly bearing line, according to usage and precedent in the country, as well as by the terms of the agreement and the specifications of the deeds that had been exchanged by the companies or their representatives—Corrigan on the part of the Richmond, and its President, Lawton—had forever effectually barred him from entering the property of the latter in pursuit of the ore-bearing dips, spur, and sinuosities of his lode. What has Mr. Power to say to these things? Will he still insist in showering praises upon one who has exhibited such marked unfitness for coping with the ordinary affairs of business, and whom to defend would be the veriest absurdity?

Will he tell us how stands Mr. Probert with the people of Eureka, and with what indifference he is viewed by the business men of that place? How does he generally demean himself towards them, and how is he looked upon by the gentlemen with whom he is associated in the management of the property? If Mr. Power will take pains to enlighten your readers upon those points he will, if he depicts with an impartial pen and an unbiased mind, give them better and truer glimpses of the managing director's character, grotesque habits, and constitutional idiosyncrasies than any he has yet given them. If he will tell us that he is lacking in politeness, discourteous to his immediate subordinates, and arbitrary in his dealings with all who does business with the company, whose true interests he thus injures instead of serves, he will only have told us that which we of this Coast have for a long time known. Even report has it, and this report has been satisfactorily confirmed by some of the best citizens of Eureka with whom I have recently conversed, that his treatment of the company's superintendent, Mr. Rickard—who, by the way, is reputed to be an honest, capable, and careful gentleman—is more than rude, is an outrage upon common decency, and unbecoming in a gentleman.

I have also been credibly informed that he exhibited an utter disregard in both his manner and dealings for the gentlemen who composed the late commission, treating them so rudely as, I am informed, to have refused to associate with them, or even to eat with them at the same table or in the same room, or to afford them any facility whatever for pursuing the object of their mission. These things appear incredible; but they are, nevertheless, true, and I care not to pursue them further at present. I have within the last few days met the subject of the foregoing remarks in this city, where he is, according to current rumour, about to erect extensive separating and refining works, and his time apparently now is principally occupied perfecting arrangements for the immediate inauguration of this new enterprise.

Of the commissioners I will only say that they had presented to them abundant evidence of the feeling with which he is viewed at Eureka, whose people I believe wish earnestly for no more happy consummation than his early removal; and that this step would be for the best interests of the company I am now more than ever convinced.—*San Francisco*, Jan. 25.

J. H. R.

RICHMOND MINING COMPANY.

SIR,—An Old Subscriber to the Journal writing to your paper on Feb. 16, does not appear to have profited much by his experience of what the Journal has taught him in the past as regards the "weekly returns" published by American mining companies of London fame, otherwise he would not counsel spending the returns gotten out of the rapid exhaustion of reserves of ore until at least some new discoveries are made commensurate in some degree with the call which has been, and is being, made upon what has been discovered and laid open. I merely wish in the interest of American mining to urge more caution upon London management in order to prevent a recurrence of the disasters which have overtaken other Anglo-American mining companies, whose shares have gone up to enormous prices on "weekly returns" and "monthly dividends" (the Richmond Company wisely make theirs quarterly), and through which the English public have lost enormous sums of money, besides having their mines pass altogether out of their hands. I do not mean to say that the Richmond Mine is not worth 495,0000. sterling, if the public choose to give 90. a share for the shares, but what I do mean to say is that the management, who cannot be ignorant of the poverty of the mine as regards new developments of ore ground, will do well to husband their resources until such time as the equalisation of dividends in the future can be assured for at least three years. Your correspondent is incorrect in stating 7s. 6d. per share quarterly as representing 30 per cent.; it would take 13s. 6d. per share quarterly to pay this on 90. per share, and the fact of the directors not paying more than 7s. 6d. per share clearly shows that they have the interest of the company at heart in not "financing" their assets, and leaving the company without proper funds in hand in order to swell up dividends and force the shares beyond the present high price, having always the state of the mine in view.

Your correspondent "thinks" that the damage to the Eureka Com-

pany "was estimated at \$8000." What a thought for a thinking man! Does he imagine any American Company would go to law for a damage of \$8000, where their law costs alone would amount to over \$60,000 to have the question tried? No, Sir, the question of amount of damage was withdrawn from the issue in consequence of an agreement come to between the litigants that Judge Field of the Supreme Court, and Justices Sawyer and Hillyer of the Circuit Court, should try the case in regard to the ejectment, leaving it for the Eureka Company to bring suit afterwards for the damages done them; and considering that the Richmond Company had gone over 400 feet beyond the acknowledged boundary in the best ore body known in Eureka, I think it fair to assume that the damage may amount to the sum of over \$2,000,000, which it is reported that the claim will be made for when the Eureka Company see fit to make it. This claim laying in ambush further strengthens my faith in advising a modest 6 per cent. interest, and an accumulation of funds for the present. In regard to keeping "large balances," whenever such a contingency arises I do not think there will be any fear of the shareholders not disposing of them to their own "advantage," provided the money comes to England, but if your "Subscriber," makes enquiries he will find that a very considerable portion of the "estimated profits" is represented by pig-lead at Eureka, the price for which is at zero, and it would be useful to know what value the management put upon it in reporting the "weekly run" from time to time, surely here is another good reason for not taking every shilling out of the company's bankers' hands to pay dividends and force up the price of the shares.

This brings me to an item in the management of the Richmond Company's affairs at Eureka. I refer to the refining works; a similar operation was tried by practical and scientific operators at Salt Lake City, where fuel and labour are very much cheaper than at Eureka, and proved a signal failure after an expenditure of over \$200,000, and all experience has proved that the best way of dealing with the precious metals is to ship them in the bullion at ordinary rates of freight to places where there is consumption for the lead, and where the separation can be effected at the cheapest rates. How this company could ever have expected to make a profit by refining in the American Desert, where labour and fuel are at their dearest, chances of thieving good, and also having to pay 2½ per cent. for the carriage of the refined silver, must be to anyone practically acquainted with these matters—

AN EYE OPENER.

NEW QUEBRADA COMPANY, AND BOLIVAR RAILWAY COMPANY.

SIR,—In the Journals of Nov. 15 and 24 you did me the favour of publishing some remarks upon the position and prospects of the above companies. In my letter published on the later date I gave an estimate of the traffic that might be looked for upon completion of the railway. The line, now finished up to the mine, may, under judicious management, earn a fair dividend for its shareholders, and become a powerful instrument in the development of the resources of the rich agricultural and mineral provinces of the western part of the Republic of Venezuela. I have just received information that fully substantiates the statements that I have for some years past made of the local traffic that would accrue to the railway from Tucacas to Aroa.

A merchant of Barquisimeto offered a few months ago to guarantee the railway company the carriage of 50,000 bags of coffee from Aroa to Puerto Cabello via Tucacas, and return merchandise to an equal tonnage if the company would name a reasonable rate of freight. Will it be credited that the lowest price the company would accept was 14 reales per quintal for the produce, or down freight, and 16 reales for the up freight, or imported merchandise. These rates are equal to about 5½. 8s. and 6½. 3s. 4d. per ton of 2000 lbs. for a total distance of 56 miles of railway and about 40 by steamer. Now, to say nothing about the questionable policy of charging the higher rate for a return journey of wagons that must, in the absence of local traffic, be sent up empty to the mines, one would think that less than half the rates quoted would have been very remunerative, but the railway company seem to have thought that they ought not to carry cheaper than the ordinary carrier of the country—the "burro," or patient ass. In fact, I am told that when the merchant urged that he could bring down his coffee as cheap on donkeys, he was answered that if he thought the railway could compete with "burros," his hopes and expectations were not likely to be realised.

As one merchant of the district could from one crop guarantee 50,000 bags of coffee (half the total estimate given in my letter before referred to), I think facts have at last proved that the hopes held out by me in time past to the direction of the Quebrada Company were not illusive, but probably the management have got so much accustomed to the patience exhibited by the shareholders, that they seek to foster the same virtue on the other side of the water, and prefer to let the patient "burro" continue to carry the produce of the country, instead of popularising the railway by asking moderate rates of freight. Some other facts that have lately occurred with reference to the maintenance of the railway and the working of the mines, I reserve for a future communication.

Midway Chambers, Feb. 20.

E. D. MATHEWS.

NEW QUEBRADA COMPANY.

SIR,—I think your correspondent is rather precipitate in wishing to demolish the present board of this company, because the agent sent home a large quantity of what proved to be nothing but country rock, and which diminished the produce of the 20 per cent. ore which was sent home with it. The agent at Swansea was just as much to blame as the agent at the mines to allow rock without a trace of copper in it to be sampled up with 20 per cent. ore, but for this first error I would not condemn the entire management. In the case of the Cape Copper Company at the first start of their shipments the agents had not the experience they have now, but the experience they have gained since has increased the value of their shares from 6½. per share to 34½. per share, and so will experience effect the Quebrada Company's management, though certainly it does look a little strange that they should appoint a purser instead of a mining captain to select and ship ore to England, but in all probability this mistake has been rectified by this time.

The late Capt. Mathew Francis (than whom no better miner ever handled a pick) stated of this property that it was capable of supplying an almost unlimited quantity of copper ore of over 25 per cent. produce, and why such a mistake should have been made as sending over not ore but barren rock is a mystery, but it would be uncharitable to conclude that there may be persons who may want to buy the shares cheaper, and do not mind risking these experiments, knowing that plenty of high-grade ores will be presently forthcoming. I for one do not feel like being frozen out of my shares, I prefer keeping them till the freezing is over, and the sunshine appears.

COPPER MINER.

NEW QUEBRADA MINING COMPANY.

SIR,—The letters which have appeared in the last two numbers of the Journal will, it is hoped, awaken a spirit of determination among the shareholders of this company to have their affairs conducted on a more satisfactory footing than has hitherto been the case. Each week, each month, and each half-year passes in England without our appearing to progress. Every mail brings information of the hopelessly muddled state of things in Venezuela, and every shipload of ore that arrives home does not convey to us the impression, by the value of its cargo, that we have the profitable property we have always been led to believe; on the contrary, ores of very low value have been sent to England, and their arrival here has created a most uneasy feeling amongst us.

We were always informed by the Chairman and directors in their blindest manner that all that was needed was communication with the coast, and then we should have a splendid return for our money and no further anxiety would exist. We have a perfect communication now with the coast by means of a railway, and what is the result? Worse than nothing, as, by referring to the Share List, you will see that our shares are lower now than they were before the line was finished. Again, as I am informed, nine-tenths of the rail-

way has now been in the hands of, and worked by, the railway company for 12 months. How many tons of ore, and of what value, has the Quebrada Company sent down to the coast?

There are, of course, many other points in the management of this company far too numerous to enter into now, which need explanation. I will, however, add that I quite agree with the remark of the "Dissatisfied Shareholder" that this very unsatisfactory state of things is entirely due to "want of proper management," and the first step that I sincerely trust will be taken, and taken soon, by the shareholders will be to insist on Messrs. Hemming and Campbell D'wines being superseded.

London, Feb. 20.

ANOTHER DISSATISFIED SHAREHOLDER.

FLAGSTAFF.

SIR,—By a typographical error in my letter in last week's Journal, I am made to state that Mr. Pearson (it should have been Mr. Manbey) was "going to take steps to restrain," &c. The word "latter" was printed instead of the word "former," as intended. If you will be good enough to insert this note by way of correction, you will greatly oblige—

M. C. VINCENT.

AUSTRALIAN AND TASMANIAN TIN.

SIR,—Some months ago, from reliable information received, I was enabled to communicate to you the rapid falling off in the production of the East Australian and Queensland tin fields. The account given then has since been sufficiently verified; but we had the Tasmanian production so rapidly following the Australian that no relief was to be expected until that, too, should show some evidence of exhaustion. Now I have to notice the very exhaustive report on the Tasmanian tin fields made by Mr. John Mufford, and communicated to you in a series of well-written letters appearing among the Original Correspondence in the Mining Journal. For this report Mr. Mufford deserves the thanks of the whole tin-producing community for information which had been sadly needed, and not before obtainable. My object in addressing you is, however, more directly to remark on what appear to me as the legitimate deductions from the information gained. On a careful perusal of Mr. Mufford's communications it appears that bar the Mount Bischoff Company's works all the others are markedly ephemeral, as out of a number of about 90 mines or works named as producing tin in the six months ending December, 1876, no less than 39 had ceased producing at or before the end of that year, so as not to appear in the producing list in the six months ending June, 1877. In that list of about 55 mines or works producing at the end of June, 1877, we select 45 which collectively make a return of less than 110 tons of tin ore—less than 2½ tons each—and about 8 cwt. of tin ore each per month. These facts seem to show how diligently they are working their deposits, and being all surface deposits, how rapidly it must all come to an end. Mr. Mufford's account of how thoroughly and rapidly the deposits (except those worked by the Mount Bischoff Company) have been stripped down upon the shelf or bed-rock shows this still more forcibly.

Now, the Bischoff Company has (again quoting Mr. Mufford) "two 80-acre sections, which embrace the whole of the top of the mountain, except the east arm;" and, again, he remarks, "this is the great depositary of the district." Now, Mr. Mufford tells us that the Bischoff Company produced in six months ending December, 1876, 626 tons 11 cwt. 2 qrs. 2 lbs. of tin ore, which in the six months ending June, 1877, had declined to 477 tons 14 cwt. 0 qr. 10 lbs., a falling off of 148 tons 14 cwt. 0 qr. 10 lbs., or nearly 25 tons a month. This falling off in the production of the only tin-producing mine in Tasmania which is at all likely to extent its existence beyond a few months points pretty clearly to a rapidly failing production, and to corresponding improvement in the value of tin.

In this communication I have availed myself freely of the information contained in Mr. Mufford's very excellent letters, to which I would refer the reader, as together forming one of the most intelligible reports ever written on any mining district. I do not think that I have made any unwarrantable deductions here from Mr. Mufford's letters, but if so I will thank that gentleman if he will kindly set me right. A prominent writer in the Journal expresses sympathy with the consumers of tin, who are getting their metal under producing price, if that price moves up a few shillings, but he expressly says that he has no sympathy with the thousands of producers in Cornwall who are suffering distress from having to sell below a fairly remunerative price. Now, it seems certain that, in spite of the strongly expressed and not unbiased opinion of the writer of the articles referred to, a few weeks will compel him to tune his music to rapidly improving prices. In this case his present proteges will scarcely thank him for having prevented their regularly purchasing their usual and regular supplies for consumption.

W. TREGAY.

COST-BOOK SYSTEM V. LIMITED LIABILITY.

SIR,—There appears to be such frequent misstatements appearing on this question in the correspondence in your widely-circulated Journal that I hope some able correspondent who has paid attention to the both systems will fully reply. But I cannot myself help referring to the late communication of Mr. F. Dormer, who writes so energetically against the Cost-Book System. I think many of your readers who have had any experience in cost book mines will agree with me that Mr. F. Dormer knows very little of the rules and regulations. True a few cost-book mines may be badly managed, and come to grief. Some banks fail; insurance offices and other mercantile businesses fail, but it is not enough to condemn the whole system. I prefer the Cost-Book System because it enables a shareholder to determine his liability in a fair and legitimate way. There are very few cost-book mines in Cornwall but what a buyer can be found at a price, however small; if not, he can pay up, and resign his shares at a general meeting, and if any assets he can claim his proportion. Mr. Dormer would find that if he was a shareholder, and liabilities incurred during that time, and the mine going into liquidation, his man-of-straw system would not answer, and that he would still be held as a contributor. The error generally committed by speculators in cost-book mines is that they hold too many shares to be paying calls on from time to time. If the mine does not turn out a success so soon as anticipated the way is to lessen the number of shares. If a call on 100 shares is too much sell 50 of them, or further reduce as may be necessary; even a small number of shares in a successful mine is better than none where one's inclination leads him to speculate. That the Cost-Book System is the most desirable for starting and developing mines there is no question if fairly and legitimately carried out, an efficient secretary being a great desideratum. It is that the Cost-Book System is not sufficiently known at the present day that we find such gentlemen as Mr. Dormer writing so strongly against it. Had one-fourth of the capital expended in floating limited mining companies during the past ten years been expended in legitimate mining under the Cost-Book System we should have more dividend-paying mines than we have at the present time.

As to limited liability companies it may not be out of place to give my experience of them. In talking to a mining gentleman not long since at our first interview he informed me he had lost 20,000l. in one mine. After a little time, intimating the mine, I thought it rather a large sum to lose in one mine. On referring I found it to be a limited liability company in 30,000 shares of 1l. each. It so happened that shortly after I met the resident agent, who informed me that all the money expended on the mine did not exceed 3000l., and then went into liquidation. In another limited mining company a gentleman is interested, having a considerable number of shares, on which he has paid 1l. deposit, being liable to a further call of 1l. per share, and finds himself in a dilemma, he is disgusted with the whole affair, and wants to get out of it, but cannot. No one will purchase his shares, and he cannot relinquish, the board of directors receiving pay, with a secretary, manager, and resident agent, with only two miners working. It is fearful. It is ruinous. What can he do to relieve himself of his impending ruin? Mr. Dormer would confer a great favour if he can enlighten him how to escape. Probably he will be told that he ought not to incur the liability that he is unable to meet. How many more are there in

the same category? Therefore, according to my views, if the Cost-Book System was more generally known it would become the medium of investments among mining men of the present day.

Feb. 20.

E. ERWIN.

THE INGERSOLL ROCK-DRILL.

SIR,—In your last week's Journal your correspondent, J. Barkell, seems to know much about the Darlington drill and has a great liking for it, but his remarks about the Ingersoll drill are very absurd, and showed a desire to say something cutting. If the Ingersoll has only bored three holes 2 ft. deep in the 10 days since the machine (query, what machine) was erected it must be evident to everyone that the fault was not in the Ingersoll, but was owing to the fact of its not having been put to work for some cause or other; possibly the machine that had been erected for 10 days did not give the necessary compressed air. Mr. Darlington and we ourselves know the merits of the Ingersoll and Darlington drills respectively, and neither need the aid of the pen to prove their advantages.

London, Feb. 21.

LE GROS, MAYNE, LEAVER, AND CO.

TREATMENT AND SEPARATION OF ORES.

SIR,—In last week's Journal "F. T. K." describes an invention patented by a Major Bolton for separating copper pyrites and other ores (after being made magnetic by heat) by magnetic machinery. This process was invented and patented by Mr. King, and has been in successful operation here for the last two or three years. As the process was the subject of a paper read by Mr. King before the Miners' Association of Cornwall, which received the Mining Journal special prize as well as the silver medal of the Royal Polytechnic Society, and as the latest edition of Ure's Dictionary describes Mr. King's process, I should have supposed the invention was too well known to be re-patented. I can further inform "F. T. K." that Mr. King tried the Barrow and Butson ores with much success, but I believe financial reasons prevented the erection of the necessary machinery. There appears to be no law to prevent an invention being re-patented again and again. The original inventor cannot interfere till the infringement is put in operation. It would be well for those who are blessed with a large share of inventive genius to make themselves acquainted with existing patents, and also to be a little more particular as to the source their inspiration comes from.

Rushen Mine, Colby, Isle of Man, Feb. 19.

J. BARKELL.

THE MINERAL RESOURCES OF IRELAND—No. III.

SIR,—In the vicinity of the port of Crookhaven there are some valuable copper ore mines, of which Dhurode Mine may be set down as of the greatest importance. The extent of this mineral estate is about 500 acres, and it is approached by a good road, the formation is clay-slate, traversed by many east and west parallel bands of porphyritic slate. There were ten east and west and two caunter lodes discovered in this property. The east and west lodes incline south at nearly 1 in 3, and the caunter lodes also lead in a southern direction, but in a less degree. One caunter lode, known as the Bird Island lode, is a large and well-defined metallic band, having a bearing of 20° south of east and north of west; it averages 2 fms. wide, and at its outcrop on the sea shore contains copper and iron pyrites, associated with a highly ferruginous quartz gangue. No mining operations were ever carried on in connection with the lode more than a few shallow costeaning pits, sunk for the purpose of ascertaining its true course, though the appearances must at once catch the miner's eye as indicative of no small amount of mineral treasures beneath. But, apart from the prospects of large quantities of copper ore in depth, the iron pyrites of this lode contains in places 2 dwts. of combined gold to the ton of stuff, and as this great mineral course seen in the property for half a mile has never been proved below the surface, I regard it as worthy the attention of enterprising mining men. The other caunter lode of this property is even of greater prospective value than the one just named; in its course through the sett it intersects most of the east and west lodes, and in the workings, which were carried on upon it to the depth of 45 fathoms in one place, it returned thousands of tons of rich copper pyrites. This is called the great caunter lode; it is about 3 fathoms wide, and carries a powerful elvan course along its full length. The latest operations were on a vein of copper ore 3 ft. wide, and over 20 fathoms long, and which lode is now intact below the 45 fathom level. This course of ore was followed as deep as possible without the aid of machinery, but there was no money found to purchase a pumping-engine to grapple with the influx of water, even though a splendid shaft is sunk, large and fit for any purposes; consequently in this place an undoubted prize may be easily and cheaply gained. This is one of many instances of the folly of commencing mining in Ireland with as many hundreds of capital as thousands were requisite to develop the mine. Another feature in this lode that should not be lost sight of is the fact that it has been proved in two places—one on the verge of Dunmanus Bay, where it makes an outcrop in the cliffs; and the other, half a mile inland, to contain gold-bearing iron pyrites. At both these places the influence of the east and west quartz lodes that come in contact with the caunter have swelled its dimensions to great proportions, and may have contributed to its gold-bearing qualities.

Two or three of the east and west lodes have been explored to the depth of over 30 fathoms, and quantities of rich purple and yellow copper ore extracted, but I regard their contact with the great caunter lode as the best feature connected with them, for they unite with it at acute angles, the course of the caunter being about north-west and south-east. This mine was going for about 20 years in a small way, and numerous shallow levels driven from the face of the high cliffs inland upon the lodes; and though it is an undoubted fact that the great caunter lode, where it formed junctions with two east and west lodes near the sea, was richer in the bottom levels than at any other point, the influx of water, and the inability of the adventurers to procure the needful to pump it out, brought about a collapse about eight years ago, at the very time when prosperity would have shone its brightest upon them under more favourable pecuniary circumstances. An east and west lode, running through the full length of the property, as indeed they all do, has produced good stones of sulphide of lead (Pb S); it was excavated to the depth of 6 or 7 fathoms near the eastern boundary of the sett, and produced a little copper also at that place. The copper ore workings are chiefly confined to the western portion of the property, due north of Crookhaven. A horizontal bed of hydrated peroxide of iron, 1 foot wide, extends along the low lying portion of the Dhurode valley, but has never been turned to account.

Balten Mine adjoins Dhurode Mine on the West, and is but a continuation of some of the Dhurode east and west lodes in the cliffs at Balteen; a good section of several of the lodes is seen to a depth beneath the surface of 40 fms., where they are washed by the troubled waters of the Atlantic Ocean that often lashes into foam against this bold and defiant coast. A little was done in the way of exploring the lodes by means of short levels in the cliffs and shallow pits on the surface, but nothing to be called a fair trial was ever carried into effect; the lodes are usually about 3 ft. wide, and the veinstone ferruginous quartz, as at Dhurode, strongly impregnated with yellow copper ore; this mine could be proved at very little expense, owing to the facility afforded by the high cliffs for driving in levels on the course of the lodes to a depth of 40 fms.; the containing rock is also much disturbed and contorted, and is easily and cheaply worked, and the deads may be trammed into the sea.

Indications of copper are observed to extend westward from Balteen for a distance of five miles till the Three Castle Head is reached, in which bold and precipitous head land are seen immense flexures and contractions of the strata, also cupiferous beds and patches of shale, but no defined lodes. Leaving the wild and truly romantic scenery of the Three Castle Head, the once great strong hold of the famous O'Mahonie chieftains, and proceeding south about two miles the Mizen Head Mine comes in view; here, however, a more congenial country for the production of mineral is at once apparent, for a good copper ore lode was opened on, and a quantity of mineral extracted. Notwithstanding which no deep explorations were made, the quartz gangue of the lode presents a beautiful gossany appearance, which, together with the other favour-

able qualities of the lode, indicate quantities of mineral beneath. The same lode also makes an outcrop one mile further east at a place called Corren, where it presents a favourable exterior in like manner.

The Brown Head Mine is situated two miles west of Crookhaven, and stands next in this district to Dhurode Mine in point of prospective value; the formation is clay-slate, and, like the Balteen Mine, a section of the lode is seen in the cliffs overlooking the Atlantic Ocean, and one was sunk upon nearly 20 fms. below the sea level; this was considered a rich mine when at work, as it yielded sufficient ore to pay costs though attacked in a very primitive fashion; the ore produced was the true Erubese variegated copper ore, containing 50 per cent. copper; this, however, gave way to copper pyrites, yellow copper ore in the deepest working. No shaft was sunk from surface, nor any recognised system of mining carried on, which may in a measure be attributed to the fact that little or no capital was employed in the development of the mine; however, in a few years' operations about 70000l. worth of ore was obtained in great part above the level of the sea. It is said the mine looked well in the bottom levels, and would likely be a good paying mine up to this time if it were not for the ruinous system of working, and the failure of the proprietor in his business transactions elsewhere. Ten years have elapsed since anything was done in this place, but some day doubtless enterprise will alight upon a prize here. South and east of Crookhaven on the strip of land forming a breakwater to that haven of refuge for Atlantic-going ships of any tonnage is the Crookhaven Copper Mine; in this mine a good shaft was sunk on one of the lodes, and cross-cuts put out to prove parallel lodes, but ore in paying quantities was not discovered, though there is no evidence to show that the mine has had a fair trial in depth and length on the lodes; yellow copper ore was the chief product of the mine, and purple copper ore was also found near the surface.

On the other side of Crookhaven Harbour, at Spanish Cove, midway between Rock Island and the village of Goban, is a large and well-defined quartz lode highly charged with copper pyrites; it is well worthy attention, but has never been proved deep. North of Goban copper ore was discovered in small quantities associated with quartz and chlorite. Two miles east of Goban, at Ballyrizzood, are some good looking beds of cupriferous shale and quartz lodes charged with grey copper ore. The ancients excavated on this property, but no modern workings were carried on; there are good inducements for speculators here also.

At Canties Cove, two miles east of the Dhurode Mine, copper ore was discovered, but not in paying quantities. In the neighbourhood, too, manganese iron ore was discovered in a bed a few feet beneath the surface. Without entering into detail I have touched on most matters of mining interest in the Crookhaven district, and do not hesitate to say there are some fair speculations in this locality.

Birmingham, Feb. 20.

THOMAS TONKIN.

MINING IN IRELAND.

SIR.—Permit me to tell Mr. Thomas Tonkin that there never was an ounce of barytes of the justly celebrated Dereenalamane Barytes Mine shipped in Dunmanus Bay. It is, and always was, shipped at Ballydehob, the freight being much lower at the latter port. If Mr. Tonkin has not read a series of papers on the Mines of West Cork and Kerry by "Your Special Correspondent," and published some two years ago in the Journal, he may peruse them with profit and advantage.—Glandore, Feb. 19.

VERITAS.

CORNISH MINING A PROFITABLE SOURCE OF INVESTMENT.

SIR.—That no time in the annals of mining has presented a better opportunity for the investor to make rapid profits than the present is evident from the fact of a general reaction in commerce consequent on peace negotiations between the late belligerent powers. That mining is a profitable source of investment may be known from the fact that the copper and tin mines of Cornwall have realised altogether such astounding profits as have gained for them a world-wide celebrity, it being well known that most of the leading Cornish families are indebted to them for their influential positions and wealth. The extraordinary apathy displayed by the public for the last two years towards this enterprise, caused, no doubt, by the universal stagnation in trade, has caused many a valuable property to be forced down in market price to almost a nominal figure, indeed the writer knows of some having, through perseverance and well-directed management, gone on (notwithstanding the depression and low price of metals) to approach a dividend state actually quoted at about two years' purchase, the result now will be a general rush after shares in mines of this class, hence a repetition of what took place after the last panic, when shares rose in three months in market value 300, 500, and some 800 per cent., enriching those who took time by the forelock in proportion to the amount invested. Such mines are destined ere long to command a high position in the market, and those who purchase in time invest their money at a good rate of interest, while the principal is safe for considerable augmentation.

CHAS. BAWDEN.

St. Day, Cornwall, Feb. 21.

HOLMBUSH MINE.

SIR.—This mine, according to published reports issued periodically from Holmbush House, has paid for a long while past dividends twice as great as Dulcoath, and three times as great as South Caradon. This being the case, everyone interested in mining in the West is enquiring with wonder the meaning of the announcement that an application should be made in the height of prosperity to the Court of Chancery to wind-up the company. It has been a matter of considerable surprise for some time past that the main portion of the workings should be suddenly stopped, the stopes being represented as yielding abundance of arsenical-mundic and arsenic, being at the same time quoted at a higher price than (with one temporary exception) it has ever attained before, but this winding-up procedure is far more surprising still.

A LOOKER ON.

HINGSTON DOWN CONSOLS.

SIR.—From the correspondence which has taken place with regard to recent changes in this mine, it appears that the superintendence of the workings, including a great number of tribute pitches and tutwork bargains, returning from 150 to 200 tons of copper ores per month, and the whole of the general requirements of the company, are expected to be satisfactorily conducted by a single agent. To anyone having the least knowledge of the duties usually devolving on agents in the proper care and development of a mine 170 fathoms deep the impropriety of such an arrangement will be at once apparent. It is very questionable if such a parsimonious and impolitic state of affairs would be allowed to continue by any other body of shareholders in the two Western Counties for a single day. The sooner a meeting is called to place matters on a sound, reasonable and practical footing the better it will be for the company.—Feb. 19.

A SHAREHOLDER.

HINGSTON DOWN CONSOLS.

SIR.—I have hitherto refrained from taking any notice of the correspondence which has appeared in your columns having reference to the above mine, but as the remarks in the letter of "Observer" to the effect "that the mine is without manager or engineer," and those of your correspondent "N," that "the management of the practical development of this property, which has hitherto been conducted with experience and judgment, is now entirely disarranged," are evidently written with the intention to mislead and convey to outside shareholders an impression that Capt. Thomas Richards, the present manager, is incompetent, and may tend seriously to injure his position. I am impelled by a sense of duty to attempt to remove such erroneous ideas, and to say that he has acted as manager and agent of important mines in various parts of the county for forty years, and that he has been the agent of Hingston Down for 19 years or more, and that his abilities as manager are fully equal to those of any agent in the district. Great mines make great men, and it does not follow because a man has not a successful "bal" that he is to be considered

wanting in "experience and judgment." There are many other mines which can be mentioned where even great men have failed, and one need not go far from Tavistock to learn that "experience and judgment" have not always proved of great advantage to confiding adventurers. These facts need no comment, and I trust will be sufficient to prove that the interests of the shareholders are not likely to be imperilled by the change in the local manager.

Callington, Feb. 20.

A SHAREHOLDER.

WHEEL PEEVOR.

SIR.—Being at Redruth to-day I instituted enquiries into the condition of several of the mines in that neighbourhood, and particularly into that of Wheel Peavor. This mine is situated in the manor or barton of Sinns, in the parish of Redruth, the land of Sir F. M. Williams, Bart., M.P. (3-5ths), and the Rev. St. Aubyn H. M. St. Aubyn (2-5ths). The original limits have been extended by the addition of land on the southern side of the late boundary, so that the present extent of the grant is sufficiently comprehensive for the company's purpose of exploring all the lodes which they have discovered, which are four in number, all partly explored.

The main lode at present is called the south lode, which was discovered within the last two years by Capt. White, the manager, in succession of Capt. A. James, and from this lode all the returns of tin are derived. But for this discovery it is probable the workings ere this would have ceased. The returns are about 35 tons of tin per month. The first intersection of this lode was by a cross-cut at the 60, made since Capt. James left, and which he would not permit to be driven during his management. Capt. James is an intelligent miner, but herein he erred in judgment. This discovery the public say has been the salvation of the mine. The lode is also intersected at the 48; its intersection is daily expected at the 36, and this week it has been cut at the deep adit level. At every point of intersection the lode is proved to be wonderfully productive. The reserves thus laid open above the bottom level will occupy many years of operation to take away, which, with tin at the present low figure, may be expected to give good profits.

The depth of Wheel Peavor is 130 fms. from surface, including the adit of 50 fms., and the Gwennap great adit, which unwaters all the Gwennap mines. The pumping-engine is a 60-in., discharging the water partly at the adit, and partly for dressing uses at the surface. Some of the water in North Downs Mine is said to percolate through to the great cross-course which separates the two sets. That cross-course is called by many "the county cross-course." North Downs, I am told, is under grant to Mr. T. Pryor, the purser of this mine and also West Peavor, at the western side of this set, into which new sets all the lodes pass.

The reduction engine is a 32-inch, and the winding-engine 24-in. The metallurgical arrangements are said to be most perfect, so that the cost of dressing the tin ore is kept within the narrowest possible limits, and the slimes carried down the valley would not pay anyone for his time in taking out the small quantity of tin contained in it.

Everyone interested in Cornish mines must feel regret that the wealth embedded in the rocks should be disposed of at the current prices, but I see no remedy; we must yield to the inevitable. The time may not be remote when more remunerative prices will recur. The tin ore, which formerly fetched 100l. per ton, is now sold for 38l.—Truro, Feb. 20.

R. SYMONS.

THE LLANRWST LEAD MINE.

SIR.—In reply to Capt. Robert Knapp's letter, in the Supplement to last week's Journal, I may say that as I am not a practical miner it would, therefore, be useless for me to inspect the underground workings of a mine with a view of making a report thereon. I am a shareholder in Llanrwst, and have applied by letter three times to Mr. Carter, the secretary of the company, for an order "for my agent" to inspect the property. No notice has been taken of my repeated application, and I cannot but conclude certain parties connected with the company are afraid to have the mine inspected by disinterested practical authority for fear he should not endorse the astounding reports given by interested persons.

The report I sent out cost me sundry guineas; it may not have been put together in a miner-like style, still I have every reason to believe it was truthful. I was not the writer of the report, neither am I "Inspector," as Capt. Knapp would insinuate in his insolent letter of last week. Few miners can write more sanguine and inflated reports than Capt. Knapp, of Llanrwst, and I should be sorry to invest money through his statements alone. In the Llanrwst Share-List he stands for 400 shares, at what costs I cannot say. I well remember some 16 or 17 years ago the wonderful discovery of silver made in Ludcott and Wrey Mine by the manager, Capt. R. Knapp. Shares rose from a few shillings each to 28l. in a short space of time, and suddenly came down with a run, and soon afterwards wound up. I am not aware how many shares Capt. Knapp held or bought at a few shillings each, or sold at 28l. per share, or less. However, one fact is certain—the silver did not hold long, and shares fell from 28l. to 9l. within a month.

The investing public and the brokers and dealers depend entirely upon the manager of a mine; he is the practical man, but unfortunately many mine managers traffic in shares. They are paid servants, and as such have no right to job in shares; they buy when shares are low, good reports soon follow, the mine is made to improve greatly in value, shares rise hundreds per cent., when too frequently the mine manager sells out, and very soon after the mine begins to fail off, the reports are far less sanguine, and shares fall rapidly in price. It is high time nefarious practices were made public, as Capt. Knapp suggests. There are mine agents whose eyesight appears to magnify immensely when they get underground—1000 cwt. of lead is quickly made into as many tons, and 5000l. worth of reserves is soon converted into 50,000l. worth.

I venture to say no mine in the world was ever puffed up like Llanrwst. It has taken some dozen firms to write this property up, and many of your readers have no doubt been induced to buy shares at 4l. within the past three months, which are now saleable at 1l. 10s. It is a question whether they cannot legally demand their money back. It is of the utmost importance that one or more honest practical mining authorities should carefully inspect and report upon this mine for the satisfaction of one and all concerned.

H. GOULD SHARE, Stock and Share Broker.

Poultry, London, Feb. 22.

GREAT WEST VAN.

SIR.—I am not going to retort on the questionable letter to which Mr. Ward has appended his name in last week's Journal—suffice it that Mr. Ward cannot contradict one statement, and bring evidence to prove his assertion. He attempts by subterfuge—attributing insinuations, &c., to "Fair Play" and Mr. Greene's clerk. Mr. Ward's own acts give the greatest confutation to his own letters, re the 313 shares. His acceptance of 113 as the balance of same, although clever and honest, Mr. Ward would have us believe he "was enjoined into taking 200 shares out of the said 313 shares for his clients," &c. Mr. Ward, if he knows anything—and his hanging-on "financing" promoters ought to have taught him—that on application and allotment a broker can nominate his clients for any portion of such allotment—thus saving transfer stamps and fees. Why was this not done? Was it that such nominee would have become entitled to his proportion of bonus or brokers' shares at a time when the shares showed every probability of going to a considerable premium?

Mr. Ward, by participating in the profit of floating this company—by taking the 313 shares, and his backing up his client, Mr. Greene, by buying 300 shares for him, although the shares were never taken out of his name and paid for, and may to this day form a part of the 1000 shares now in Mr. Ward's name—renders Mr. Ward's assumption of Diogenes ludicrous—"Because," says Mr. Ward, "I have taken up this matter in my own interest and that of the public with a determination to have clearer interpretation of the doings of the directors and those connected with the bringing out of the company."

Can any of your readers believe Mr. Ward so astute and so successful as he would make us believe that he joined a company to the extent of 1313 shares, which cost him a net sum of 16000l., did

not know every vendor, secretary, and director of the late and present company, and that for many years prior to the floating of this concern. That Mr. Ward knew more of the late secretary's dealings by the large account he had open with him than any minebroker on the market. Surely Mr. Ward suffers from hallucination; on no other ground can any sane person reconcile such acts and conduct—re the dividends.

Common sense tells one that to appoint a deputy to act for one by legal form binds the principal as though he were there present. After protests like Mr. Ward's letters are waste of words. I will not, therefore, pursue so contradictory a string of statements. Mr. Ward is on the horns of a dilemma. He joined his friend Greene as the broker to the company of a bona fide property, on which (different to many companies launched before the public) had been expended in cash 36,000l. He knew everyone interested in the promotion of the company. He was present at the allotment of the shares. He had every facility for obtaining every information during the working of the mine. He has had 313 shares free, and transferred 200. Let him, like Diogenes, hand over 6200l.; the company will be then free of debt, the liquidator discharged, and the company free to work again. The liquidator, Mr. Waddel, will in justice to the shareholders who paid cash for their shares probably see to this. Until this is done I fail to see any sense in the rigmareole Mr. Ward has favoured your readers with. FAIR PLAY.

Feb. 18.

ACCOUNT-HOUSE EXPENSES.

SIR.—I notice in last week's Journal that Mr. R. Symons is still abroad with his fault-finding. I hope he will shortly establish a model mining company of his own views, whether limited or cost-book. It appears to me ridiculous to go back half a century to rake up what then used to be. It is a different age we live in at present, many changes taking place—as many for worse as better in my opinion. At the present time, taking into consideration the salary of the majority of mine agents (say) eight pounds or guineas per month, with the present cost of living, and from their position obliged to appear respectable, they cannot be considered to be overpaid. In my opinion it would be false economy to cut off pay-day dinners—let it be 15s. or 30s.; they bring the agents, manager, and purser together, and if they have the interest of the adventurers of the mine in view they would discuss as to what is best to be done, and talk over matters in connection with the mine. Without the dinner the manager goes his way to get home in time to dine, the purser has an engagement, and wants to make haste in the same way; Capt. Jack and Capt. Will cannot do anything but touch pipes and grumble over the niggardliness of the company not to allow a bit of dinner on pay-days. Did Mr. Symons ever find it acceptable to drop into an account-house in his rambles, and take pot-luck on pay-day? If he has not others have. I do not believe there is any economy in grinding agents too low. There may be among them a few who may indulge too freely on owners' account when opportunity offers, but in my opinion the mine agents of the present day do not require to be assisted home, or to come under the elegant expression "like a dead pig in a cart," on straw.

Feb. 20.

E. ERWIN.

ANOMALIES IN MINING.

SIR.—The letter of "N," in last week's Journal, calls attention to strange anomalous proceedings in regard to Hingston Down Consols. The anomaly is still more unaccountable by contrast, presuming the same Providence rules over the affairs of both Hingston Down and Bedford United Mines. However, I am not unmindful that the River Tamar divides the two mines named, and that they are situated in opposite counties; the rules prescribed for Cornwall may not be so applicable to Devonshire, but it does appear as if laws were made for a "god" in the latter case rather than founded by one and the same deity over both mines. The supervision required for each of these mines is about equal, but in the former an elderly gentleman is ordered to discharge the duties and be minus the perquisite of horse and carriage, his salary being 8l. 8s. per month. In Bedford United we have—

Capt. Goldworthy, manager, salary per month.....	£9 9 0
Capt. Phillips, underground agent.....	7 7 0
Mr. Horawill, purser and clerk.....	6 6 0
William Richards, coachman and storekeeper.....	4 0 0
Wear of carriage and harness, and keep of horse.....	2 10 0
Add for account house expenses.....	2 10 0
Total.....	£29 2 0

When the deliberations of the directors, under Limited Liability, are in the hands of the shareholders, it will be seen, no doubt, that so far as the secretary is concerned his salary is made commensurate with the duties of his office which, under the new system, will be equal to that of Hingston Down. Respecting the resident manager, it is questionable if the office could not be as efficiently filled at half the present cost, but if for party reasons he be retained, could not another office, such as the clerkship or storekeeping, be added? and so justify the present salary, and with a managing agent going underground as often as is essential—say, once a week; surely there is no necessity in a mine of the nature of Bedford United for the underground agent to go below surface every day, and could not one or other of the offices named be undertaken by him? The purser having his hands so full of other business, no doubt would gladly be relieved of the more onerous duties of his post at the mine, and would call occasionally—say, once a week—to see the accounts are kept in their usual order, at a small sacrifice of his present salary. I would recommend to the directors a more equitable adjustment, as follows:—

Capt. Goldworthy, for management and attention to stores, per month.....	8 8 0
Capt. Phillips, underground agency, and attention to the accounts.....	8 8 0
Mr. Horawill, superintendence of accounts.....	4 4 0
Total.....	£21 0 0

I would also recommend the attention of the cost sheet by Capt. Phillips, in addition to the signature of the manager, as ordered by the secretary, which might be a preventive of further aggression by the renowned trio or "triple alliance." And also advise that the horse, carriage, and trappings be dispensed with, that there be substituted with the proceeds a weighing machine, in order that coals and other heavy material discharged at, and delivered from, the mine be more strictly taken account of, as well as for greater expedition in weighing. I would further advise that all articles, small as well as great, be bought by tender, delivered on the mine.

Continuing to be deeply interested in the welfare and prosperity of Bedford United, I am still persuaded that good things are in store for those adventurers who have patience to wait the termination of the present crisis, provided vigilance and economy are exercised by the directors.

Tavistock, Feb. 21.

JOSIAH WEDGWOOD.

[For remainder of Original Correspondence, see to-day's Journal.]

LEAD MINING IN SCOTLAND.

The following is the report by Mr. T. CURRIE GREGORY, F.G.S., Civil and Mining Engineer, on the Stotfield Lead Sett, at Lossiemouth, on the Moray Firth:—

I was somewhat taken by surprise when told of a deposit of lead in that part of Scotland, but when I had examined it I was still more surprised that it had been overlooked. The strata I found to be the Devonian contemporaneous with the ore-bearing rocks of Cornwall and Devon. The retaining rocks of the main lode are of a highly indurated siliceous nature, and the lode itself is composed of a true gangue for lead-crystallised quartz, fluor-spar, and carbonate of lime, interlaced with veins of galena and phosphate of lead, and often occurring in masses. Its course is nearly east and west; it touches the sea at one point; from this point to the west its course is concealed by the sand dunes about 15 ft. above high water mark, but at a distance of about 400 yards the lode shows up on the south wall with good lead. It was not opened upon so as to enable me to speak of it particularly, but I do not doubt that the lode continues for the 400 yards mentioned. At the sea a shaft has been sunk in the country rock close to the south wall of the lode; this wall is but little off the perpendicular. The shaft was full of water, so I could not descend; I was told that it was 45 ft. deep, that the water was fresh, and that the lode had not been tapped. Close to the south wall three pits have been sunk a few feet, and from them fine masses of solid lead have been and still can be cut.

I cannot speak too highly of the lode so far as I could see it on the south wall. The gravel and shingle of one beach covered the part of the lode to the north (across the lode) for some 50 ft., but from the high-water mark for some 70 ft. more it is clearly seen rich in lead. Masses of galena can be blasted out at very numerous places—in fact, I never in my experience saw such a massive lead lode with such appearances at surface; it would appear, then, that the lode is about 120 ft. wide at this place. I wish that the shingle had been removed that I could have examined the lode throughout, but others I am told can speak to the continuity of its ore-bearing character; 50 yards or so to the east I could trace the lode for the width named ore bearing throughout. The lode touches the sea for (say) 80 yards, and then the coast line leaves it. To the east various coarse pits have been put down, and there is some evidence of a counter lode coming into the main lode somewhere about the shaft; of this I am by no means certain. The lode can be traced bearing lead for about 250 yards east of the shaft; the shaft is 5 ft. by 7 ft., and is timbered. A high pressure 14-horse power engine is standing in good order ready to take out the water; the pumps are 9 in. diameter, and there are 15 fathoms of spare pumps on the surface.

I should suppose that the lode be cut at about 30 ft. below high-water mark, and an opening made to surface on that part of the lode which is clear of the sea level. A slope should then be carried to the east gradually increasing in width and height as the ground rises about 20 ft. above high-water mark. A slope of this kind, 20 to 40 ft. high and 30 to 120 ft. wide, should be laid open east, and the lode itself broken in large quantities as by quarry operations at a cost of not over 3s. per ton.

The deads could be thrown back, and the orestuff run up an incline near the engine-shaft by a drum and pulley to a height sufficient to allow the stuff to be trammed to the west of the shaft, and treated by a Blake's stone breaker, a roll crusher, and by self-acting dressing machinery, such as is manufactured by Mr. George Green, of Aberystwith. All this can be done very well and economically, as the ground is suitable. Water can be pumped up also to the same height, and carried west to the floors by ladders.

The above mode of working may be considered novel in lead mining, but it is practicable here, and if the lode holds to a moderate depth throughout as it shows at surface, very large sales of lead ore may be made at a minimum cost. In addition, the part of the lode which is under water between tides, and which shows so rich for lead, could be stoped for a few hours each day, and quantities of lead ore got. Also the shaft can be sunk and the lode proved in depth, and ultimately an extensive mine may be opened. There are only two questions of importance which will suggest themselves to many minds, which arise from the operations having been so limited, and these are:—

1.—Will the sea water percolate through the lode and cause heavy pumping? I am quite at ease on this point, as the lode does not run into the sea, but skirts the coast, and only a portion of the north part of it opposite the shaft is under water, and that only for a short time as the tide flows and recedes. Besides, the gangue is close.—2. Will the show of lead on the surface hold down? We have so far proof of this, as the lead in the pits near the shaft and on the beach is 20 to 30 ft. under the lead on the surface to the east, the lode having been washed down to this extent. The gangue also is all that I could wish for, and I cannot see any reason why the lode should not improve in depth.

It will be seen from the above report that this lead property is removed from the ordinary category of lead mines, and I think there is good evidence that it will be a success if properly worked.

Queen Victoria-street, Dec. 28.

T. CURRIE GREGORY, C.E., F.G.S.

FOREIGN MINING AND METALLURGY.

The Belgian coal trade has continued extremely quiet; intending purchasers appear bent on temporising, in order to secure low prices. The season promises, accordingly, to be a very indifferent one for Belgian coalowners. The extraction is much in excess of the consumption, and foreign competition is more active than ever. In the Couchant de Mons prices have been very feeble, and an eventual fall of 5d. per ton is spoken of. In the Liège district the position of colliery proprietors is no better. It appears that the collieries in the Sarrs basin produced last year 4,403,958 tons of coal, against 4,450,607 tons in 1876, and 4,473,206 tons in 1875. The extraction of the Ruhr basin considerably increased, on the contrary, last year; the sales of Ruhr coal were also upon a larger scale in 1877. The Spanish Government, wishing to encourage Spanish coal mining industry as much as possible, has contracted with Austrian mines for the delivery of the coal required for the Spanish Navy; hitherto English coal has been almost exclusively employed.

The French Coal Trade continues extremely depressed, as there has been scarcely any revival in coal-consuming industries. In consequence of the mild character of the winter, which has now nearly glided away, the domestic consumption has also been languid; under these circumstances stocks begin to be large and troublesome. Prices have been dropping. The production of coal in the Nord in 1877 amounted to 3,216,939 tons, as compared with 3,303,006 tons in 1876. Last year's total of 3,216,939 tons was made up as follows:—Anzin, 2,042,036 tons; Aniche, 533,654 tons; Douchy, 157,225 tons; Escarpelle, 262,445 tons; Vicoigne, 121,216 tons; Azincourt, 44,962 tons; and Trenesmi, 55,661 tons. The cost price of the coal raised last year in the Nord averaged 8s. 9d. per ton; the average selling price was 10s. to 10s. 5d. per ton. The production of coal in the Pas-de-Calais last year was 3,423,981 tons, as compared with 3,336,768 tons in 1876.

An important meeting of industrialists was held last week at Paris to advocate generally a protectionist policy, and to oppose further reductions of import duties. Several ironmasters and colliery proprietors assisted at this meeting. The French iron trade remains generally in much the same state; there has been no revival of industry, and all that can be done is to maintain prices. In the Haute-Marne there has been some little demand for special iron, such as T-iron, fine plates, machine iron, &c.; wire has also been selling a little better. In the Nord iron has made 5l. 12s. per ton for current orders, and 5l. 8s. to 5l. 10s. per ton for important transactions; heavy plates have brought 5l. 16s. per ton. Upon the Paris iron market the tone of business has become rather more hopeful; there is no immediate prospect of an advance, but the fall in ordinary qualities of iron appears to be checked. In the Loire district there has been a good current of small orders, and an almost entire absence of large ones. MM. Revollier Bietrix and Co., of St. Dizier, are stated to have accepted 11l. 4s. per ton for steel-plates required for the French Navy. The Creusot works have contracted to supply the Eastern of France Railway Company with tyres for five years at 11l. 12s. per ton; hitherto 13l. 12s. per ton had been regarded as the lowest possible minimum price.

The Belgian iron trade has presented an extremely quiet tone. Everything which is being done is upon a small scale. There are small orders for merchants' iron, small orders for rails, small orders for plates, small orders for cast-iron columns. At Charleroi, however, the market, without being active, has presented a more confident tone. In the Liège group the English market engages a good deal of attention; hitherto only ordinary girders, it may be observed, have been dispatched from Liège to England, but now ordinary girders are about to be delivered. The conclusion is announced of a contract for 12,000 tons of iron rails for an Italian line; the prices at which this contract has been taken are, however, so low as to excite surprise even in these confessedly stagnant times. Further information as to this contract appears to be desirable.

Some time ago a considerable sensation was made in the iron trade by the production in the Krupp rolling works, at Essen, of 340 tons of steel rails in a single day. When the German Emperor visited these works last November this mass of steel was arranged as a trophy, representing the greatest weight of rails ever known to have been produced by a single firm in one day. We learn from the Journal de Liège that the feat has been surpassed in the Seraing works, where 365 tons of steel rails have been recently produced in a day. What makes the latter feat more remarkable is that this rate of production was maintained for six successive days, the enormous quantity of 2054 tons of steel rails being turned out of the machines in one week. One Belgian firm can, therefore, produce from 80,000 to 100,000 tons of rails per annum.

During the war there has been a scarcity of coal in Odessa, which has been supplied, as recently noted in this column, from the Austrian pits. The deliveries of Austrian coal to Odessa, says the Tagblatt, have now ceased. Immediately after the signature of the armistice at Adrianople, two English ships with coal entered the harbour, and these have been followed by others, as the English had accumulated enormous stocks of coal at Constantinople, in order to be ready for the Black Sea Trade as soon as hostilities should be suspended. In consequence of the English supplies which are now being poured in, coal prices in Odessa have declined more than 50 per cent. The Silesian pits only will suffer from this competition, the Orawitzer pits having established a steady business in Bucharest, where good prices are obtained for their coal.

SEPARATING SILVER FROM LEAD.—For separating silver and other precious metals from lead an improved apparatus and process has been invented by Mr. A. K. EATON, of Brooklyn, U.S., according to which a cast-iron bowl or bath, which is heated by a furnace, is mounted upon a vertical shaft, and is rotated or driven by any convenient means, the bowl or bath being surrounded by an annular trough to receive the lead when discharged therefrom by centrifugal force. A receptacle or kettle is provided for the reception and removal of the lead from the trough. The process consists in thus centrifugally driving off or separating the lead, and for this purpose, or as assistant thereto, to the alloying the silver-bearing lead or metal with (say) from 1 to 2 per cent. of zinc, or some convenient equivalent thereto. On motion being given to the combined mass of metal properly heated in the bowl or bath, the centrifugal force will tend to separate the silver from the lead by causing the latter to overflow from the edges of the bowl or bath into the annular trough, the persistent and lighter alloy not responding so readily to the centrifugal action, but remaining in a concentrated condition in the bowl. If gold be present as well as silver, it is better to allow the metal to cool down and form a crust before starting the centrifugal action. It is considered proper that the bowl or bath should have a parabolic form, but such form is not essential.

Meetings of Public Companies.

ENGLISH AND AUSTRALIAN COPPER COMPANY.

The ordinary general meeting of shareholders was held at the Cannon-street Hotel, on Thursday, —Mr. R. A. ROUTH in the chair. Mr. C. B. ROGERS (the secretary) read the notice convening the meeting, and the directors' report was taken as read.

The CHAIRMAN stated that the object of the meeting was, as they had heard, to receive the report of the directors and to elect two directors and an auditor. With regard to the work done during the past year, they would have seen that the gross quantity of furnace material received from various mines during the year ending June, 1877, was 13,632 tons, against 13,752 tons in the preceding year. The quantity of material smelted at the Port Adelaide works was 6183 tons, against 7924 tons; and at the Newcastle works 7342 tons, against 6479 tons. The quantity of copper made at Port Adelaide was 1554 tons, against 2043 tons; and at the Newcastle works 1230 tons, against 894 tons. The quantity of copper shipped and sold was 2776 tons, which, considering the depression which had prevailed, he thought could not be considered unfavourable. He would, then, pass on to the profit and loss account, which showed a debit balance for the year of 1952l. 9s. 4d. This result showed that the operations of the second half of the year had been so far successful that the debit balance of the previous half-year of 6620l. 12s. 2d. had been reduced to 1952l. 9s. 4d., and this sum the directors propose to write off from the reserve fund, which now stands at 11,908l. 12s. 7d., secured by copper warrants. This apparent loss was due to the estimate at which they took the price of copper last year, and which was readily explained. In January, 1877, the price of Barra copper was 84l. per ton. In February it fell to 76l. 10s., and continued to fall, with slight intermission, until in November it reached its lowest point of 72l. 10s. From that date it gradually recovered to 74l., at which it now stands. This fall not only affected the stocks on hand in England and Australia on June 30, 1876 (included in this year's accounts), to the extent of nearly 10,000l., but, of course, had an adverse effect on the purchases of ore during the first six months of the year ending June 30, 1877. He thought they must admit that they had done a great deal in making such a change in the financial position as they had done. Any great improvement was not to be expected, and the reason of these exceptional times was also easy to find. They had had a great depression in all the metal trades, as well as in many other branches of industry. A committee was now sitting in France to examine into the cause of the depression, and commissions had been appointed in this country, but he thought no such enquiries were of any great value. We had passed through a time of war, which had taken away two of our best customers. By the famine in India the consuming and producing power of that country had been limited, and if that had not been sufficient they had had the scandalous repudiation by foreign powers of their debts. It had been a very anxious time for the company, and he was glad to be able to say that they had recouped in the second half-year the losses of the first. When they met again any profit made in the interim would be applicable for dividend, and he thought he was entitled to claim that great credit was due to the directors for having been able to steer the boat through so well as they had. To go back to the more quiet part of the report, they would observe that there was an item 3147l. for interest, which at first sight might appear to be large, but they should remember that they had to pay colonial rates. It was to be remarked the larger this item the better in one respect, since it showed the larger business which they were doing, and it secured them the same benefit as if they had a large capital on the other side. He need scarcely tell them that a very slight fluctuation made a great difference to them, and it was always their endeavour to buy the ore at the closest possible price. They endeavoured to purchase as low as possible to give themselves a profit, but they endeavoured to avoid stopping the mines. As to this side, he (the Chairman) would read the shareholders' extract, showing the effect of one fluctuation upon a single mine. The Devon Great Consols had to sell two parcels at a Cornish Tackling, which at the price of the previous sale was estimated to yield 10,000l., owing to decline in price they obtained but 6540l. Now, if a mine can lose to that extent—3640l. on two parcels—they would readily understand that their company must of necessity lose when they bought at a high unit and sold at a lower. One of the principal London brokers—Messrs. Rogers—stated that there was one continued fall during 1877, and it was a continued fall that was so difficult to deal with; but he read these extracts simply to show what credit was due to their agent to be able to purchase so well in a falling market. As to wages, they had paid for labour 16,866l. in the year under review against 17,833l. in the previous year, so that as to labour they had got an advantage. For fuel they had paid 13,630l. against 18,490l. in the preceding year.—(A SHAREHOLDER: The Port Augusta property?)

—Well, he did not intend to say anything about the Port Augusta property, but would do so if they wished it. At the present moment the Far North is unexplored. Copper in profusion has been found there, but it was unremunerative to bring it down owing to the difficulty of carriage. Seeing it was a fine agricultural district the Government voted 1,000,000l. to make the railway to the mines, and their agent, with his usual acumen, had not let the opportunity pass. The matter was explained in the report that in view of the completion of the railway north of Port Augusta, and the supplies of ore it would bring down from the mineral districts, it was thought desirable that the company should acquire a water side section at the port for the purpose of erecting smelting works if necessary. He anticipated that copper would come there, so he bought 8 acres down at the port. When the railway is finished it will probably be valuable. At Adelaide he did something similar, and their property there is now worth from 60,000l. to 70,000l. They thought that hereafter they might produce regulus at Port Augusta and bring it down to smelt at their works at Adelaide. He might mention that many things which at first sight appeared prejudicial to the company turned out to its ultimate advantage. The Communists at Paris had rendered their assistance by causing the opening out of the mines of New Caledonia. The French Government had shipped out 600 or 700 Communists there, and these had made roads which enabled the company to get large supplies of ore from New Caledonian mines. The famine in India would also prove to their advantage, as it had led the Government to turn their attention to the opening up of the interior of India, and would thus cause an increased demand for copper. And even the commercial depression itself would not be to their ultimate disadvantage, for it had caused increased emigration to Australia, and the larger the population the larger would be the supply of labour. Indeed, it was a fact that when the Old World was in difficulty it was beneficial to the New. But the matters upon which the shareholders most required information he could not, answer satisfactorily; their position was sound financially, and as to the management on the other side, he hoped the shareholders would have the same opinion as to the directors on this side. Their future was good, and he hoped they would have a good supply of ore and labour. The purchases of ore which they were now making could scarcely fail to give them a profit; indeed, they had made some profit on the last six months' operations, and he did not see why it should not continue. He concluded by formally moving the reception and adoption of the report.

Mr. A. COBBETT seconded the motion. A SHAREHOLDER enquired what was the estimated value of the Kooronga works?—The CHAIRMAN said those works stood at cost in the balance-sheet, and they could not fairly put any other value on them. The shareholders were all well aware that if the Barra Barra got fully at work again the Kooronga property would be of great value to them. If the Barra Barra were not opened again it might ultimately have to be sold for the value of the land.

Mr. JOSEPH DOANE did not see that there was much cause for congratulation. Mr. Fewer had told them at a previous meeting that arrangements should be made for selling copper at the same time as they bought the corresponding quantity of ore. He also referred to the Rio Tinto having made an arrangement with their competitors—the Tharsis and the Santa Dominga—whereby the price was sustained. He could not see why a similar arrangement could not be made by their company.

Mr. FAWCER said the question would not be a troublesome one to answer. They had endeavoured to arrange their sales to coincide with their purchases, but unfortunately there were two parties who had a voice in the matter. There was the buyer as well as themselves, and the consequence was that they could not always sell when they wished without making a sacrifice which would not be justified.

But they had done something more than that. The mineowners declined to sell to them below the current rate to meet the difficulty of a steadily declining market, and determined to ship to England. Their agent, therefore, agreed to purchase at whatever price might rule at the time which would correspond with the arrival of the ore in England. By this arrangement they merely obtained the smelting profit, but they avoided loss which, however well they might purchase, and however quickly they might convert, was almost inevitable in a constantly and gradually falling market. This principle of purchasing forward was the only remedy, and would, therefore, be partially adopted until better times returned. As to the Rio Tinto arrangement which had been mentioned, they had endeavoured to make a similar arrangement, but hitherto had not been able to effect it.

After some further discussion Messrs. R. A. Routh and Spencer Herapath were re-elected directors, and Mr. John Viney auditor, the proceedings terminating with the usual complimentary vote of thanks.

FRONTENAC LEAD MINING AND SMELTING COMPANY.

The annual general meeting of shareholders was held at the Cannon-street Hotel yesterday, —Lieut.-Col. P. HARRIS in the chair.

Mr. GEORGE GIBBS (the secretary) read the notice calling the meeting, and the report of the directors was taken as read.

The CHAIRMAN commenced by an allusion to the financial state of the company's affairs. The difference between the present accounts and the last was not great, excepting in one or two items, and those were of the same nature, consisting in capital advanced by the directors and their friends necessary for the progress of the works, for the shareholders were aware that in these times they could not expect in the beginning of any enterprise much support from the public, who were ready enough to come in when the pioneers had cleared all the difficulties away, and then they would like to come in at par, but were not at all disposed to help a company through its difficulties. Under those headings came bills payable, which were considerably increased, but since the accounts were made out a great many bills had been paid off. The loan account was a little over 2000l., which was money advanced by the directors and their friends. When the accounts were made out there was a small amount due on the smelters' account, and a small amount on the debentures, a few coupons not having been presented for payment. On the other side of the accounts he would call attention to the great enhancement in the value of the property through the operations which had been undertaken, and to a great extent completed. The original value of the mine, including all that was taken upon it, was 50,000l. Since then the efficiency of the working had been continually increased, and there had been placed on the mine buildings and materials amounting to 756l. 4s. 8d. At the last meeting he stated that the directors intended to arrange smelting works, as the district in which the property was situated was of great mineral wealth, and it was to the interest of the town of Kingston that it should be developed. The smelting-works were begun about the second week in July, and in 10 weeks they were finished. At present there was only one furnace, but arrangements had been made to extend it to any extent which might seem desirable. The flue was necessary for the condensation of the lead, which always to some extent passed away in vapour. The sum of 267l. had been laid out by the company in land, and for that amount the company, aided by the very valuable advice of Mr. George Morton, of Kingston, had got a very valuable plot of land, with a water frontage of 400 feet. A pier had already been run out 50 or 60 feet, and had got into a depth of 5 feet of water. The land was close to the goods depot of the Grand Trunk, which was in connection with the Great Western, so that the company had really water connection with all the world. The land was obtained at a very cheap rate, and there was a further quantity of land which could also be obtained at a cheap rate if the company found it necessary. There was no doubt that the mineral district in which this company's property was situated was destined to become of very great importance, and as this company was the pioneer it certainly ought to reap the first benefit. He might mention that Mr. Stockwell, the managing director, had made arrangements with the municipality to relieve the company of local taxes for ten years, and he was again going out in the hope of being able to secure still further advantages for the company. The smelting works had been erected in a most creditable manner under the direction of Mr. Kilshaw, who came to the company with the highest recommendations from a position of 13½ years, and Mr. Kilshaw had certainly proved himself to be a thoroughly scientific man, a good mineral chemist, and a thorough smelter. With respect to the operations underground, what he stated would be done at the last meeting had been practically carried out. With the aid of the Diamond Drill Company they had got beyond 28 fms., and had driven a 28 fms. level, and done other underground work; they had not yet done any stoping, but had laid the foundation for future operations. The state of the works at present was this—that they would be able to begin when the frost broke up in the middle of April, and go straight forward with stoping and smelting. A more satisfactory state of things could not be expected.

Mr. SLOCOMBE asked what terms had been made with the Diamond Drill Company, and also when the contract had to be executed? The CHAIRMAN said the work was done by piecework, this company having to furnish the Drill Company with certain facilities in the way of materials, and in some respects with steam. The Drill Company was now progressing at such a rate that when the mine was wanted for work everything would be ready. The Chairman then formally moved the adoption of the report and accounts.

Mr. G. MORTON seconded the resolution, which was put and carried.

On the motion of the CHAIRMAN, seconded by Mr. BOURNE, the retiring directors, Capt. E. G. M. Donithorne and Mr. G. Morton, were re-elected.

The auditor, Mr. Edward B. Slocombe, was re-appointed. Mr. SLOCOMBE, in acknowledging the compliment, bore testimony to the excellent way in which the books and accounts were kept. He was sure the shareholders must be well satisfied with the manner in which the business was conducted. Speaking as a shareholder himself, he expressed his opinion that in this mine they had a bona fide property, and might fairly look forward to the time when they would receive a handsome return upon their capital.

The CHAIRMAN, in answer to Mr. WEST, said that the ore in hand at the time of the last meeting had since been realised, and was contained in the value of the smelter's lead.

On the motion of Mr. WEST, seconded by Mr. SLOCOMBE, a cordial vote of thanks was passed to the Chairman and directors for their able management of the company's affairs.

The CHAIRMAN acknowledged the compliment, and bore testimony to the admirable manner in which the managing director, secretary, and other officers had discharged their duties.—The meeting then broke up.

WHEAL UNY.

A general meeting of the shareholders was held at the offices of the company, Austinfriars, yesterday.

Mr. R. McCALLAN in the chair.

Mr. J. HICKEY (the secretary) read the notice convening the meeting, and the minutes of the last were confirmed.

The following report was then read:—

Feb. 21.—In handing you a report on this mine, we have to state that owing to the stoppage of the surrounding mines we have had a great influx of water to contend with, which has greatly retarded the sinking of Hind's shaft below the 150. We are, however, continuing the sinking by six men, and are carrying only a small portion of the lode till the shaft is sunk to the 170, when the lode will be cut through. The speculative rise in the 60, west of incline-shaft, is worth 7l. per fathom. We have two stopes in the back of the 120, east of King's shaft, worth 7l. and 8l. per fathom respectively. The two stopes in the back of the 180 east are worth 7l. and 15l. per fathom. The 140 east is worth 5l. per fathom. The three stopes in the back of this level are worth 30l. per fathom in the aggregate. The 150 east yields low-quality tinstone. The 150 west is worth 15l. per fathom. A stope in the back of this level behind the end is worth 30l. per fathom. We have apparently a good piece of whole ground standing over this end, which we think will prove very valuable. The 160 east, east of Gooding's shaft, carries good stones of tin. The 160 west, west of incline, is worth 8l. per fathom; we hope soon to have a good improvement in this end. There are two stopes in the back of the 150 west worth 10l. and 12l. per fathom respectively. We are selling good quantities of tin (about 30 tons every four weeks), but we regret to see the price so very low. The highest price we have had during the past 16 weeks has been 43l. per ton, and the lowest price 33l. 6s. Had only this maximum price been maintained it would have helped us very considerably. The mine, on the whole, is looking well, and if we could obtain a better price for the metal we should speedily give profits.—WM. RICH, MATTHEW ROGERS, JOSEPH RICH.

The financial statement for four months was examined which, charging cost to December, showed a loss on the working of 1036l. 14s. 6d., and a balance against the mine of 1719l. 5s. The accounts were read and adopted, and a call of 5s. per share (1073l. 15s.) was made.

The CHAIRMAN remarked that although the mine had produced a greater quantity of tin than on any previous occasion, yet owing to the unprecedented low price a heavy loss was incurred. During the winter months their coal bill had been very heavy, but he trusted for the future that the water charges would not be so heavy. The agent's report was most encouraging, and they must persevere in the hope of a better price of tin. The committee were of opinion that a call should be made to cover the loss. The accounts were

brought up close, and a 5s. call would put them in a sound financial position.

A vote of thanks to the Chairman terminated the proceedings.

DENBIGHSHIRE CONSOLIDATED MINING COMPANY.

A special general meeting of shareholders was held at the offices of the company, Great St. Helen's, on Friday, Feb. 15, Mr. FRANCIS RUDALL in the chair.

Mr. E. J. BARTLETT (the secretary) read the notice convening the meeting.

The CHAIRMAN: Gentlemen, this is simply a meeting called to confirm a resolution adopted when we last met. Mr. Bartlett, with one of the board, has been down to the mine during the past few days, and he may be able to convey to you additional information regarding the present prospects of the undertaking. I am glad to say that already some of the points in progress look much better, and there seems every probability of early success. I beg to propose that the resolution increasing the capital to 60,000l. be confirmed.

Mr. BARTLETT: At our last meeting I stated that at my own risk four men were put to drive the 66 west. At that time no lead was in sight, but our agent thought that the character of the ground was such as to lead him to think that before many yards were opened lead ore might be found. I am glad to tell you that we have already sent ore from this part to surface, and although in the few days' trial no great quantity has been cut, nevertheless the results so far have been very satisfactory. At the eastern level progress has been made in rising, and indications are good. At Parry's workings the old sump is reached, and next week we shall issue a good report. Improved ventilation has enabled the men to do a good day's work, and the various operations are being conducted vigorously; it is, then, but reasonable to expect good results in the future. The directors earnestly hoped that all the proprietors would take up their proportions of the new capital; it would be a matter of much regret if it was found necessary to offer them to the public at such a low figure. You must not forget that the liabilities of the company have to be met.

Mr. COOPER: I have been to the mine since our last meeting, and so satisfied am I that I have resolved to take a large number of shares.

Mr. JOY hoped that if any shares were left they would not be offered to the public at 10s.

The CHAIRMAN: I can hardly see how we can help doing so. Shareholders are slow to perceive how desirable it is for them to support us now.

Mr. BLAND: I intend taking up my shares. (Hear, hear.)

Mr. GAMBLE: I visited the mine with Mr. Bartlett, and can fully corroborate all that has fallen from his lips. A large shareholder accompanied me, and was so pleased with what he saw that he handed the secretary his application for 500 shares. (Hear, hear.)

A SHAREHOLDER: Can't you give more time as to payment?

The CHAIRMAN: We will afford every facility possible.

The Chairman's motion was seconded by Mr. BLAND, and carried unanimously.—The proceedings then terminated.

[For remainder of Meetings, see to-day's Journal.]

THE WILD DUCK, OR SPORTSMAN'S ARMS.

"I tell you what, comrades," says Jan Temby, "that things aren't looking fitty at all; everybody will tell us there will soon be a good price for tin and copper; but the don't know one bit more about it than Jan Bodiggey, and Jan can tell us when there will be a better price so well as the biggest blown-up authority in the county." "I don't think anybody can tell," says Jemmy Down. "That's true," said Jan Temby, "everybody is hoping, and that's all that can be said about it." "But one thing," said Uncle Henry, "is very sure, and that is, if we can't rise tin and copper at a profit with present prices our bails can't stand, and that's certain; for, to be going on hoping for better prices is like a piasse of children shutting their eyes and opening their mouths, and waiting to see what God will send." "This is all very well," says Jan Jewell, "but how is the thing to be done? Tin from 35l. to 40l. per ton, and the standard 80l. for copper, can we workmen men live and keep body and soul together on less wages than we're gotten? I'm sure we can't and be able to do a day's work. Well, then, what's to be done?" "A new system," says Cousin Will, "must be introduced from top to bottom, and such a system of operations as will cause tin and copper to be raised at a profit at present prices. One way will be to give the men 'long extents,' and abolish 'four-weeks months.' This would considerably lessen the cost of production, and at the same time enable the miners to earn more wages. Introduce boring machines wherever practicable, adopt an entirely new plan of hauling stuff; have educated engineers, pay them proper wages, and save money, and make the engines do one-third more duty than at present. Have captn dressers who know their business, and not gentlemen going about making speeches at public meetings. Let all the officers in a mine, from the highest to the lowest, be appointed by merit, and real ability, and not by interest. I believe Old Tom was right when he said months ago that stamping all kinds of tinstuff without careful picking and selecting was a fatal mistake, and that dry dressing eventually will, to a great extent, be introduced; and further, it appears that in some mines they have had too much stamping, and by way of advancing backwards they are going to sell the tin in the stone. It is not likely a 'tin buyer' would buy tinstone at a loss. On the contrary, he makes a profit by it. It is, therefore, a certainty that his profit is the adventurers' loss. Let all mines have a captn dresser who can dress tin as cheap as a tin buyer, and keep changing till they find the man who is able to do it, and he will be the right man in the right place. There are plenty of such men to be found; these are some of the things if carried out with extreme care and economy will enable our mines to hold their own against all the world; and the sooner a searching investigation and sweeping reform takes place in all the mines the better will it be for all concerned." "Now, that's what I could sound discourse," says Old Tom, "and a ought to be printed in the *Mining Journal*, for our boy Henry the other night heard Captn Dick reading accounts of all the mines in the world in the *Mining Journal*, and Cousin Will's speech ought to be sent there." "So a ded," says Uncle Henry, "I'll ask Captn Dick to do it." "Well sose," says Old Tom, "I must go back again to my old story. Everybody will tell us that our great bails are so deep and costly they can't pay, but I say the can, and some of the cheapest are only just beginning. But, then, if you want the cream of the thing, like our grandfathers had, begin some new bail; there's scores of miles of lodes not yet touched. Begin some of the and you'll find and rise plenty of tin and copper cheaper than any furriner in the world. You can do this in new' ground without machinery like the old men." "But who'll do this?" says Jan Temby. "Why we must keep hammering away," says Old Tom. "Every one in this mitten is able to work, and our labour is equal to money; hev we take up a set in—Cair, and begin to work out, of course we'll soon show something that will make our neighbours jump." This was agreed to, and the little bail was christened Wheel Success.—From Cousin Jack's Unpublished MSS.

EPPE'S COCOA—GRATEFUL AND COMFORTING.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected cocoa, Mr. Eppe has provided our breakfast tables with a delicately flavoured beverage which may save us many heavy doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—Civil Service Gazette. Sold only in packets labelled "JAMES EPPE and Co., Homoeopathic Chemists, London."

HOLLOWAY'S OINTMENT AND PILLS—LIMB AND LIFE.—Not many years ago some ulceration and diseases of the joints placed in peril the affected limb whose loss was recommended to spare the risk of life—now the discovery of these noble remedies has made the cure of the worst maladies no longer a matter of doubt. Holloway's treatment preserves the condemned limb, and in its course of cure improves the general health and vigour of the frame. Holloway's ointment and pills heal all sores and ulcerations, and extirpate scrofulous sores. Ulcers, bad legs, scrofulous discharges, swollen or gathered glands, contracted sinews, enlarged joints, rheumatic and gouty concretions are readily remedied by the proper and persevering application of these cooling, healing, and purifying preparations, which are as powerful as they are harmless.

Registration of New Companies.

The following joint-stock companies have been duly registered:—

WEST AFRICAN GOLD MINING COMPANY (Limited).—Capital 50,000l., in 500 shares. To acquire a mining claim in the district of Wassau, West Coast of Africa, comprised in an agreement between Colin Troup and G. O. Hooper. The subscribers (who take one share each) are—J. A. Skelcherley, 23, Medina-road, Lower Clapton, no occupation; W. C. Rackstraw, Clapton, bank clerk; J. R. Troup, 189, Strand, W.C., secretary; F. Pritchard, 230, Richmond-road, Hackney, clerk; J. H. Murray, 9, Wiltshire-road, Brixton, Custom House agent; J. G. Jebb, jun., Naval and Military Club, Pall Mall, no occupation; C. Murray, Walford-terrace, Clapham. The managers of the company will be Messrs. Thomas Best and W. M. Brown, of the firm of T. Best and Co.

BLAEN CAELAN UNITED LEAD MINING COMPANY (Limited).—Capital 24,000l., in 240 shares. To acquire mines of lead, parish of Llanfihangel Gnewydd, Cardigan, with the plant and machinery, &c., known as the Blaen Caelan Mine, and the West Blaen Caelan sett. The subscribers are—Jonathan Pell, Aberystwyth, manager, 12; E. Atwood, Aberystwyth, solicitor; C. H. Stokes, Perddid, Cardigan, no occupation; A. Milled, Carlyle-square, Chelsea; S. King Church, 7, Great St. Helen's; R. Larchin, 4, Finsbury-circus; H. G. Gush, Crescent-road, Hornsey. The directors are not yet appointed.

SILVERBAND COMPANY (Limited).—Capital 5000l., in 500 shares. To lease from Sir H. C. Tufton, Bart., seams of lead, copper, and other metals within land at Milburn and Knock, Westmoreland. The first seven subscribers (who take ten shares each) are—John King, jun., Chesterbow street, Manchester, cotton spinner; G. R. Harrison, Hagley, near Stourbridge, manufacturer; W. R. Perrens, Torquay, gentleman; Frank Evans, Stourbridge, colliery proprietor; G. Angus, Newcastle, leather merchant; Joseph Davies, Warrington; E. Beck, Warrington. The company is registered under Table "A."

WEST OF ENGLAND COMPRESSED PEAT COMPANY (Limited).—Capital 50,000l., in 50 shares. To work for peat on land at Dartmoor. The subscribers (who take ten shares each) are—F. Hinton, Broad Cyst, Devon, gentleman; W. Greene, Bedford, gentleman; Robert Suely, Exeter, tea merchant; T. B. Purnell, The Retreat, Exeter, coal merchant; W. Treheane, Exeter, wine merchant; W. W. Wreford, Exeter, journalist; W. J. Barnett, South Molton, mine agent.

NOTTINGHAM GLACIARUM COMPANY (Limited).—Capital 40,000l., in 40 shares. To carry on business as ice merchants, dealers, &c. The subscribers (who take one share each) are—R. Enfield, Nottingham; J. W. Lewis, Nottingham; John Manning, Nottingham; W. P. J. Allsebrook, Nottingham; T. A. Stephenson, Nottingham; W. Ford, Nottingham.

ATLAS STEAMSHIP INSURANCE ASSOCIATION.—This is an unlimited company, the subscribers being for the most part residents at South Shields.

BISHWELL COAL AND COKE COMPANY (Limited).—Capital 25,000l., in 100 shares. To acquire and work the Bishwell Collieries, lately worked by the Bishwell Collieries Company (Limited). The subscribers (who take one share each) are—G. H. Hopkinson, 3, Regent-street, banker; W. B. Lee, the Grange, Southgate, esquire; L. Paget, 7, Cromwell Gardens, admiral; John Hall, Stockport, esquire; E. J. Reed, 74, Gloucester road, naval constructor; E. N. Englefield, Queen's Gate, W., vice-admiral. The qualification for directors is the holding of 25 shares, but the board is not yet formed.

MCABE AND COMPANY (Limited).—Capital 50,000l., in 200 shares. To take over the business of Messrs. McCabe, East India Company. The subscribers are—J. M. McCabe, 31, Basinghall-street, 7; J. M. McCabe, 87, City road, 5; R. Hinde, jun., 2; William Wilson, Bedford Leigh, Cheshire, 5; Thos. McCabe, 87, City-road, 3; O. Barron, Oldbury Church, 5; H. E. Barker, Gresham-street, 5.

UNION BANK OF BIRMINGHAM (Limited).—Capital 1,000,000l., in 200 shares. To carry on the general business of a banking company at Birmingham. The subscribers are—John Abraham, Woodlands, Birmingham, 500; Chas. Bamford, Matthew-street, Liverpool, 500; E. Bamford, Matthew-street, Liverpool, 500; V. Blakemore, 33, Charlotte-street, Birmingham, 100; J. M. Elwell, Birmingham, 100; E. Evans, Aston Brook Mill, Birmingham, 500; H. Hollis, Long Hays, near Birmingham, 200.

CARDIFF MUTUAL IRON STEAMSHIP INSURANCE COMPANY.—This is an unlimited company.

THE TECOMA SILVER MINING COMPANY.

When will wonders cease is a question which cannot be readily answered. A reply, however, has not been missed in these days of sound energy and enterprise, and in the latter category we find the shareholders of this company moving. For the past five years very little information has been put forward, or even obtainable by those desirous to receive it, and though we have been favoured with correspondence to no trifling extent, until now the opportunity has not been presented to supply our readers with the definite statement which it is our province to lay before them. In the early part of the year 1873—a time of notorious remembrance in the annals of mining—the Eldorados of the world placed seeds in the minds of the investor of underground properties, the foremost of which, the Emma, occupied the greatest attention. The report of the riches contained in that pit occasioned the South American landowner to infuse into the British people the idea that the Emma district was not singular, but that equal capacities for the world's product would be found in the strata of the State of Utah. This previous knowledge and the existence of a renowned lode situated in the country just named could not be disputed, which went in a great measure to induce the British public to provide funds for the launching of two mines, bearing the names of the Flagstaff and Last Chance, the combined capital of which amounted to 400,000l., and on which the dividends paid amounted to 38,000l., the last distribution in both cases having been made in August, 1873.

The success which met this company-mongering led, as many of our readers may be already aware, to the invitation of new capital to the extent of 300,000l., represented by the security the subject of our article. This property, like its two sister ones, does not command a very great value on the Stock Exchange, but may be hereafter more highly assessed, mainly from the no unusual amount of intelligent energy of its shareholders, one of whom, we are glad to see, is the guiding spirit of the enterprise alluded to, and regarding whom we shall later refer to. During several years this mine has been undergoing litigation, hampered by its relative consequences of weighty debt. To remove the actual as well as the prospective embarrassments, the proprietors have spiritedly subscribed, which is to be commended, with the result that, setting aside the interest money upon the debentures, the mine is free from the moneyed entanglement which fetters the surroundings of other undertakings. The late officers of the Tecoma have expressed their willingness to accept of the offers of a settlement of their grievances now in suspense by adopting the arrangements of the present board, who are willing to distribute among them the first issued debentures, of which a balance remains unallotted. The existing board, elected at a general meeting some two years ago, consists of Mr. Charles Coles Adley, Hatcham; William Bayne, Belsize Park, N.; James W. McLeod, Talbot-square, Hyde Park; Samuel Drummond, Catechart Hill, Highgate; John Porter, Saffron-Walden; Joseph Nelson, Chestnut Villas, Baywater; W. Romanes, Keene-terrace, Worthing; with Mr. William Harrison as the secretary, and Mr. Fred. W. Snell as the solicitor. The bankers are the Imperial. The office of the company is situated at Palmerston Buildings, Bishopsgate-street Within, where the meetings of the company are held, and the directors sit fortnightly for the regular dispatch of business. It is owing to the exertions of the above-named gentlemen that the altered state of affairs is due, and to whom some show of prosperity in the mine has to be accorded.

In view of the more extended development of the mine, it was directed to issue 40,000l. nominal of preferential shares, bearing 20 per cent. dividend, at 10s. per share, 2s. 6d. being payable on application, 2s. 6d. on allotment, the balance being possibly never required; but should necessity arise, there is indefinite grace allowed for its collection. We learn upon enquiry that the application for these preferential shares is already fair, and daily upon the increase, but that no allotment thereof will be proceeded with until one-quarter of the above amount is subscribed. Upon an inspection of the company's register we find that 17,723 shares are held by persons of no occupation, 6089 shares by members of the Stock Exchange, 4247 by merchants, 1441 by solicitors and barristers, 345 by tradesmen, and 155 by bankers; and that the total of the holders thereof, who it may be noticed are residents in Great Britain, is the not insignificant number of 631.

Before closing, we should be doing an injustice to the author of a recent circular were we to omit a few of his remarks addressed to the general body of shareholders, and to whom he states—"With a confident expectation, based upon experience, Mr. St. Stephens, whose knowledge of the mining districts of Utah is both tried and extensive, has expressed his willingness to recommence operations at the shoot abandoned, owing to financial complications, leading to the main vein. The approach thereto had resulted in an output of 2000 tons of carbonate ore, as per the samples, which can be inspected. These circumstances justify that with determination and energetic management, within a period of nine months, the Tecoma—which it must be borne in mind can be inexpensively con-

ducted on account of its shallow properties—may be reasonably counted on to fulfil the sanguine expectations of its earliest supporters."

THE SCOTCH MINING SHARE MARKET—WEEKLY REPORT AND LIST OF PRICES.

The past week has been another very dull one. If anything, the feeling is now more hopeful, but the amount of business transacted is still confined to the narrowest possible limits. The state of affairs seems to be that people are accumulating their money in place of investing it, and, according to recent calculations, the annual savings of this country are so immense that it would appear, seeing now basis, and consequent return of confidence among investors, there must follow a great advance in shares of existing companies.

In shares of iron and coal concerns, Bolckow, Vaughan, A. have advanced 25s. per share, Marbella 6s., and Scottish Australian 2s. 6d., while Ebbw Vale are 10s. lower. The Bolckow Vaughan dividend is recommended at 6 per cent. for the year ended Dec. 31 last (inclusive of the interim payment in October last) which compares with 7½ per cent. for the previous year. The Marbella meeting is to be on March 5. Ebbw Vale are now 7 to 9. A dividend has been declared by the Antrim Iron Ore Company at the rate of 2½ per cent. per annum, or 1s. per share for the A. and B. shares for the past half-year, and they now sell at 45s. and 41s. respectively. Considering that the Thorp's Gower and Haug Company have five shipping wharves and an output of over 1000 tons per day, capable of being largely increased on emergency, the present prices of shares, 60s. to 70s., appear low. The order reducing the capital of the Llynvi, Tonda, and Ogmore Company has been registered. Chapel House 7½ per cent. debentures are wanted. Andrew Knowles and Sons are at 30s. dis.; ditto (25½ p. paid), 20s. dis. Bolckow Vaughan, A. 57½ to 60; ditto B. 36½; and ditto (pref.), 19½. Cardiff and Swansea, 22s. 6d. Chapel House, 54s. to 58s. Crown preserved, 30s. Great Western, 45s. Nant-y-Glo and Blaenau (pref.), 14 to 15. Newport Abercarn, 82s. 6d. Rhymney, 5½. Scottish Australian, 35s. 9d. to 37s. 6d. Sheepbridge, 16½ dis. South Wales, 5s. Tredgar, A., 10½. West Cumberland, 7½. West Mostyn 12 per cent. (pref.), 20s. to 30s.

In shares of foreign copper concerns, Tharsis continue very firm, but little dealt in; the old shares are 1s. 3d. lower, but the new ones have changed hands at 5s. advance. It will be observed the English and Australian Company have been so far successful that they are able to state in the annual report that the debit balance of 6620l. shown at the middle of the year has now been reduced to 1952l., and this it is proposed to write off. The reserve fund now stands at 11,908l. Condes of Chili are at ½; Kapunda, 1s. 3d.; New Quebrada, 2; Panulillo, 1½ to 1½; Rio Tinto (5 per cent.), 69½; Torke Peninsula, 4s. to 5s.; and ditto (pref.), ¾ to ¾. Shares of home mines continue quiet. Glasgow Caradon show no alteration on either class of shares. South Molton Consols, firm. It is doubtful if it does a mining company good to be managed by directors who hold similar positions in numerous other mining companies; for, looking at the difficulty of making sales of metals at present, it is impossible it can be otherwise than that the directors in question will give the sales to the concerns in which they are most interested, and so sacrifice the others. Bampfylde are at 4s.; Cambrian, 1½ to 2½; Cargill, ¼ to 1; Combarnat, ¼ to ¾; Dolcoath 23½; Great Laxey, 20s. to 21½; Leadhills, 3½ to 4; Medlyn Moor, ¼; Mynydd, 1½; Parys Mountain, 9s. 6d. Penarth, 4s. to 5s.; Rhosmor, 1; South Condor, 9½; Tankerville, 75s. to 76s. 3d.; Tincroft, 11 to 12.

In shares of gold and silver mines, Richmond, now ex div., is 2s. 6d. lower; the week's run is 890,000. The produce of Don Pedro for January is 5000 cits., and the clean-up at the Original Amador Mine of London and California is estimated at \$6000. The receipts at Plumas Eureka Mine of Sierra Buttes, less Californian expenses, left \$12,957 net; the Sierra Buttes Mine had been idle for want of water, but 52 stamps were since started, the supply of water having increased with good prospects for more. Antioquia are at 12s. Chicago, 27s. 6d. Eberhardt, 6½. Emma, 1s. 3d. Flagstaff, 13s. 6d. to 17s. 6d. Frontino, 40s. Javali, 7s. 6d. to 10s. Pastarena United, 4s. to 6s.; ditto, 12½ per cent. (pref.), 12s. 6d. to 17s. 6d. Port Phillip, 10s. ex div. South Aurora, 3s. to 5s. St. John del Rey, 35s. Shares of oil companies have been in favour, and a fair business transacted at better prices. Uphall and Young's Paraffin are each 12s. 6d. higher. Runcorn Soap and Alkali are at 6d. ex div. Shares of miscellaneous companies continue very quiet. A small lot of Phospho-Guano were done at 9½ ex div., but they have since been about 9. Earle's Shipbuilding are at 23½ dis.; Gloucester Wagon, 10 to 11; and Swansea Wagon, 52s. 6d. Shares of chemical companies are firm, Langdale's, 99s. 9d.; Lawes's, 7½ to 7½; ditto, 7 per cent. (pref.), 9½ to 10½; and Newcastle, 41s. 3d.

COPPER MINES.—The capital of Mellanear is 20,000l., and that of West Tolgus nearly double that, and both of these pay dividends, yet such is the unfavourable state of enterprise that what will prove, according to some of the best mining authorities, a better mine apparently than either of these two could, it is estimated, be efficiently got up at present on 6000l., or less. This property, a new mine in the celebrated Camborne district, has been opened out privately, and the prospecting is now so far advanced that it holds out the assurance of speedily becoming a splendid undertaking. It has, therefore, been determined to form a company, and erect machinery on the discoveries already made. The enterprise has the appearance of being one of those which have proved immensely profitable in the past, and it is to be desired that capitalists would direct their attention to this class of properties in place of old, deep, and worn-out mines.

BAMPFYLDE MINING COMPANY (Limited).—It is now announced that immediate steps are to be taken to form the new company lately referred to. The North Molton Mining Company (Limited) proposed to take over the Bampfylde Company. All the information afforded in the announcement now made is that the management is to be entirely new, the head office in London, and the directorate will comprise some of the largest shareholders in the old company. Considering that it was formerly stated that the company was to be formed "under respectable auspices," and that the old shareholders are being asked already to accept shares in the new company with a liability of 5s. each, it would have been thought more likely to ensure the success of this proposal had full particulars been given of the new management, directors, &c. Yet none of their names are given. Doubtless they may be expected soon. The latest report from the mine is dated the 13th inst., and holds out fair prospects for the copper lodes; as regards the iron lodes, when the market improves there is no doubt the company can at once sell large quantities of it, and we trust this valuable property will yet attain success.

Subjoined are this week's quotations, &c., of mining and metal shares quoted on the Scotch Stock Exchanges:—

Per share.	Paid up.	Rate per cent. per annum.	Description of shares.	Last price.
£ 10	48	6 ½	Arncliffe Coal (Limited)	7½
10	10	6	Benshar Coal (Limited)	6½
10	10	6	Ditto	6½
100	50	4½	Bolckow, Vaughan, and Co. (Lim.)	6½
10	10	10	Cairntrable Gas Coal (Limited)	8½
10	10	nil	Chillingham Iron (Limited)	70s.
32	29	nil	Ebbw Vale Steel, Iron, and Coal (Lim.) ..	7½
10	6	nil	Fife Coal (Limited)	70s.
10	10	nil	Glasgow Port Washington Iron & Coal (L)	35s.
10	10	—	Ditto Prepaid	40s.
10	10	—	Lochore and Capletrae (Limited)	80s.
10	10	—	Marbella Iron Ore (Limited)	51s.
10	10	—	Monkland Iron and Coal (Lim.)	36s. 6d.
10	10	5	Ditto Guaranteed Preference	70s.
100	100	nil	Nant-y-Glo & Blaenau Ironworks pref. (L)	14½
6	6	nil	Omos and Cleland Iron & Coal (L & Red.)	10s.
1	1	15	Scottish Australian Mining (Limited) ..	35s.
1	5s.	15	Ditto New	10s.
Stock	100	nil	Shotts Iron	91

Per share.	Paid up.	Rate per cent. per annum.	Description of shares.	Last price.
4	4	—	Canadian Copper and Sulphur (Lim.) ..	4s.
10	7	40	Cape Copper (Limited)	37½
1	1	15	Glasgow Caradon Copper Mining (Lim.) ..	20s.
1	15s.	15	Ditto New	13s.
10	9½	nil	Huntington Copper and Sulphur (Lim.) ..	30s.
25s.	23s.	—	Kapunda Mining (Limited)	1s.
4	4	—	Panulillo Copper (Limited)	30s.
10	10	6½	Rio Tinto (Limited)	70s.
20	10	7	Ditto, 7 per cent. Mortgage Bonds ..	14½
100	100	5	Do. 5 p. cent. Mor. Deb. (Sp. Con. Bds.)	15
10	10	22½	Tharsis Copper and Sulphur (Limited) ..	21½
10	7	22½	Ditto New	15
1	1	—	Yorke Peninsula Mining (Limited)	6s. 3d.
1	1	—	Ditto, 15 per cent. Guaranteed Pref. ..	17s. 6d.

Per share.	Paid up.	Rate per cent. per annum.	Description of shares.	Last price.
1	1	—	Australian Mines Investment (Limited) ..	8s.
5	5	7s. 6d.	Richmond Mining (Limited)	8½
10	7	6	Dalmey Oil (Limited)	8½
1	1	7½	Oakbank Oil (Limited)	88s.
10	10	25	Ditto	10s. 6d.
10	10	2½	Uphall Mineral Oil (Limited) "A"	6½
10	10	—	Ditto "B" Deferred	10
10	10	—	West Calder Oil (Limited)	72s. 6d.
10	8½	9	Young's Paraffin Light & Mineral Oil (L)	14½

Per share.	Paid up.	Rate per cent. per annum.	Description of shares.	Last price.
50	25	5	London and Glasgow Engineering & Iron Shipbuilding (Limited)	25½
20	14½	—	Pervian Nitrate (Limited)	10
7	7	10	Phospho Guano (Limited)	9½
10	10	6	Scottish Wagon (Limited)	11s. 3d.
10	4	6	Ditto New	87s. 6d.

† Interim. ‡ Per share.

Last day for this account, Feb. 25; setting day, Feb. 28.

NOTE.—The above lists of mines and auxiliary associations are as full as can be ascertained, Scotch companies only being inserted, or those in which Scotch investors are interested. In the event of any being omitted, and parties desiring a quotation for them and such information as can be ascertained from time to time to be inserted in these lists, they will be good enough to communicate the name of the company, with any other particulars as full as possible.

J. GRANT MACLEAY, Stock and Share Broker, Post Office Buildings, Stirling, Feb. 21.

We are informed that Mr. Frederick Bertram Smart has been appointed official liquidator of the Albion Life Assurance Society.

THE IODINE IRON REFINING PROCESS.

The principal defects inherent in iron as ordinarily produced are what metallurgists designate red shortness, and cold shortness; the red short metal being brittle and rotten when hot, the cold short being brittle and rotten when cold. Certain mechanical defects produced by the imperfect union of contiguous portions of the iron which ironworkers likewise call cold shorts are also very common. An ingot or other mass of iron practically free from these defects ranks very high as to quality among practical ironworkers, and the main object of this invention is to produce such metal cheaply, and with as little departure from the ordinary method of manufacture as is practicable. In working in the Martin-Siemens furnace, the charge (or the metal used, usually several tons) consists of pig-iron or cast-iron scrap, and wrought-iron, and the quality of the product has heretofore depended wholly upon the quality of the iron making up the charge. Old iron railway rails, for instance, by reason of their cheapness, might be used very profitably but for the fact that they are made up of a mixture of cold short and red short iron, and consequently the use of old iron rails, even as a small part of the wrought-iron of the charge, will produce an inferior product, and this product cannot practically be rolled off as much as one-tenth of the whole charge be old iron rails, while if the iron be treated by his improved process, 60 per cent., and even more, of the charge may be old iron rails, and yet the quality of the product be excellent.

Considering all these circumstances Mr. J. E. SHERMAN, of Boston, Mass., whose name is already known in this country from his connection with a mysterious process of improving iron, proposes that when the metal commences, or when it is ready to receive the "spiegel," a mixture is added in these proportions. For each ton of metal in the charge iodide of sodium, 400 grains; bromide of sodium, 400 grains; chloride of ammonia, 800 grains; and sulphur of antimony, 200 grains. The immediate effect of inserting this mixture is to greatly increase the fluidity of the molten metal, and it will be found that the metal is no longer either cold short or red short, and that the ingots produced are almost wholly if not entirely free from cold shute, and, moreover, that the metal is very uniform. The best mode of applying the chemicals is to mix the ingredients with about the same amount of common salt, and make the whole mixture into a package, using a paper or other wrapper for convenience of handling; this package is then put into a sheet-iron box or other like receptacle, which box is secured upon the end of a long iron rod, whereby the said box and its contents are forced down into and to the bottom of the molten metal. The purpose of this procedure is to allow the ingredients to get well into the molten metal before they are decomposed, and the only purpose of the salt (apart from the chlorine evolved) is to make the action of the heat slower. As the invention relates to the improvement of the quality of the metal, the steps subsequent to the addition of the mixture are the same as if the invention was not practised; for although the quality of the steel produced is much superior, this is solely because the quality of iron converted into steel has been greatly improved.

The essential feature of the invention is the treatment of iron with iodine in connection with chlorine to prevent its being cold short; and with bromine in connection with chlorine to prevent its being red short; and when iron is both cold short and red short in treating it with all three of these substances; other iodides, bromides, and chlorides may be used, and free iodine may also be used with good results, but he prefers the iodide and bromide of sodium, and to use the chlorine in the form of chloride of ammonia, or chloride of sodium, or both.

COLLIERY HOIST.

At all pit banks or heap stands which are not at a sufficiently high level above the railway wagons into which the coal is delivered after screening, special means have to be devised for raising the coal to the required height. Perhaps the most usual custom in such situations consists in pushing the tub on to a movable platform, which is subsequently raised to the required height by a vertical piston of a direct-acting steam cylinder, the latter being sunk in the colliery shaft; following this practice, as soon as this movable platform or table had been raised to the upper or screening platform, the tub is pushed into a so-called "tippler," or "kick-up," which causes it to discharge its contents over the ordinary screen bars; when the tub is thus emptied the attendant runs the tub back on to the platform, which is then lowered so as to receive another tub, which is similarly hoisted, and so on. It will thus be seen that this work is done by a considerable amount of manual labour, and it is, therefore, not surprising to find that mechanical means have been devised for minimising this labour and substituting a mechanical self-tipping arrangement in its place; but apart from this consideration the placing or sinking of the hoist steam-cylinder in the pit shaft is attended with much unnecessary inconvenience, since a colliery hoist which has been erected by Messrs. Hall, West, and Co., at the Woodlands Colliery, belonging to the Bidworth Coal and Iron Company, near Nuneaton, Yorkshire, not only reduces the manual labour, but dispenses with the labour attending the sinking of such hoisting cylinders by allowing the latter to be placed above ground.

This colliery hoist is equally applicable to close or box-ended tubs, or to those with open ends, and a modification has been designed with the double purpose of avoiding the breakage of soft and tender coal, as well as for leaving the whole length of the loading bank available for hand picking. The tipper runs up and down in guide rails, a catch preventing its upsetting until the required tipping height is reached, so that on reaching this summit the catch is released. Now, in the majority of cases, the point of suspension can be so selected that the centres of gravity of the full and empty tubs actually fall in such positions as not only to cause the upsetting of the full tub on the release of the catch, but also compel the tub to return to its former position after having discharged its contents, however, in cases where it is impossible to choose this point of suspension in the manner just indicated, extra stops are so arranged as to come in contact with the tipper and reverse its inclination; the tub is retained on the tipper by another catch, which may be released by a treadle. When, however, the upsetting of the tipper is effected by the action of these stops, the tub instead of lying back against the catch moves forward up to the stops which retain it in the tipper and overbalance it. It appears, on the other hand, that that degree of mechanical refinement has not been attained in the construction we are describing which would ensure a never-failing action in the tubs righting themselves again, since, when tubs of varying size and weight are used in one tipper, some of the empty tubs may occasionally fail to right themselves; though this latter

fact may be regarded as a mechanical defect, still, in justice to the makers, where such failings occur no damage ensues, for the tubs can be lowered equally well bottom upwards, when the slight jar of landing or the bankmen may right the faulty tub. The hoisting of the cage is done by a wire-rope passing over a pulley, then round a sheave formed in the piston cross-head, a tightening-up screw being attached to take up any slack. To counterbalance the weight of the cage and tipper, the cage is attached to a second rope, which after passing over another head-gear pulley, carries a balance-weight; the latter is arranged to rest on the ground when the cage is fully hoisted, thus suddenly increasing the load with a view of preventing over-winding.

The contents of the tube when being discharged fall into a shoot or hopper, placed directly under the tipper, and thence glide on to the screens. Here an inclined frame is used, upon which the tipper and tram travel; the tipper has a pair of large wheels fixed to it, which on reaching the required height relieve the cage of their load. The continued travel or hoisting transmits a slow rotating movement to the tipper, the upper portion of which is formed with a spout or shoot to receive the contents of the tram and convey them to the screen; by a further alteration of the tubs they can be arranged to tip sideways instead of endways. As to the working capacity of the vertical hoist, it will hoist four to five tubs per minute to a height of 19½ ft., tipping them and bringing back the empty tubs, and we may also observe that due regard has been paid to possible breakage of hoisting rope, by allowing the distribution of steam to the cylinder to be controlled by a valve so arranged as to cushion the steam in the event of the rope breaking.

THE EPOCH OF THE MAMMOTH.

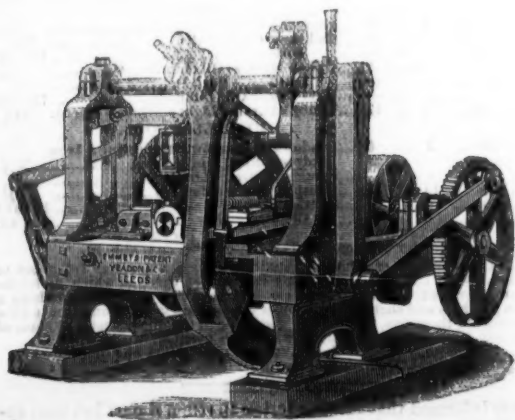
Under this title a highly interesting volume bearing upon the validity or otherwise of the evolution theory has just been completed by Dr. SOUTHWALL,* and it is probable that the facts which he records will do much to explode the leading absurdities of Darwinism. He remarks that if traces of man shall be carried back to the glacial age, and if the date of this epoch in the geological history of the earth can be fixed at one or several hundred thousand years ago; and if, moreover, it shall prove true also on examination that man is preglacial, and that his remains may be found even in the strata of the Pliocene and Miocene periods, then undoubtedly a powerful accession is made to the testimony from the lower world adduced in favour of the gradual development of animal life from earlier and more simple forms. If, on the other hand, these traces of man fall in the glacial and preglacial deposits, and the glacial epoch should prove in addition to be removed from us by no considerable lapse of time, and much more if introduced recently and since the glacial epoch man should appear in the beginning in the words of Bruner Bey, "constituted man in the full force of the term"—the man in all respects of the present day; then it is impossible, so far at least as man is concerned, for the evolution theory to be true.

It is very certain, says Dr. Southall, that at some undefined period in the past man was to be found all over Europe, south of the Baltic and the line of 54° latitude in England, living in caves, and elephants and rhinoceroses, lions and hyenas, reindeer and hippopotami abounded in all this region at that time. It is equally certain, he continues, that some time after the race had been spread over Europe a great flood covered a large portion of the Continent with water, and that this are covered large districts of country in America and in Asia. This was the flood of the Leda, which closed the Palaeolithic age. It was probably subsequent to the Noachian deluge, which was probably local in its character, and more serious in its effects within its range. It is extremely doubtful, he thinks, whether previous to this, the Biblical deluge, the human race had left their original home. They were probably up to that time shut in by the ice and the sea to a very limited area. There was an African Mediterranean sea covering the space now occupied by the northern Sahara, and an Asiatic Mediterranean, of which the Caspian and the Aral and the Black seas are the shrunken relics. Far to the south the reign of ice prevailed in Europe, and the Northern Ocean rolled far over Russia and Siberia. The Arabian and Nubian Deserts, with the snow-capped mountains of Abyssinia and the east coast of Africa, formed, it is not unlikely, a barrier in that direction. There were glaciers in the Lebanon, glaciers in the Atlas, and glaciers in Anatolia. The Himalaya Mountains constituted a barrier towards India, and the elevated plateau of Central Asia shut out China on the east, a great portion of which was probably under water, as was North-Western India; Central India, like the western part of North America, being at the same time the theatre of terrific volcanic convulsions. Such was the geology and zoology of the earth when man appeared.

The various dwellings which have been from time to time made in connection with the lake dwellings, the kitchen middens, bone caves, and gravel deposits are carefully recorded and discussed, and Dr. Southall shows almost unanswerably that man must have been created in civilised condition in accordance with the Biblical record, incidentally mentioning that even Cain was capable of building a city, and that only a few generations afterwards Noah went down to Egypt and found it an organised state; in short he shows that both evidence and investigation demonstrate that man appeared upon the earth abruptly and in a civilised condition less than 10,000 years ago, so that all the evolution theories are distinctly negatived. The volume is one of the most readable and interesting which has appeared on the subject for some time.

RETORTING AMALGAM—THE CALIFORNIA PAN-MILL.—Some interesting particulars with regard to the process of retorting carried on at the Consolidated Virginia and California mills have been forwarded to us by Mr. HENRY SEWELL. Up to the amalgamation of the precious metal with the quicksilver there is nothing peculiar in the process. When the amalgam is taken out of the tanks every morning it is at once carried to the retort-house on trucks. Once here it is weighed on these scales, and the retorts are charged. The retorts are cylindrical affairs, about 5 ft. long, and probably 15 in. across. One end is fitted with an airtight door, and the other with a pipe connected with and passing through the tank of ice-cold water at the side of the furnace. In charging the retorts the amalgam is shovelled in like sand; but none of it ever gets lost, as the work is performed by four helpers in the presence of the foreman; and as the latter is not expected to do any work, only watch his subordinates, there is no chance for any of them to get away with the amalgam or the bullion when it is taken out of the retort the next morning. About midnight the watchman throws open all the gates of the furnaces where there has been a fire during the day, in order to cool them thoroughly before the retorters come in the morning. As soon as they come the bullion is taken out in semi-circular pieces, about 10 in. long, and 7 in. or 8 in. thick in the centre. It is cut in this shape by bars placed in the retorts for that purpose. These blocks are at once chopped into pieces of irregular size, not over 4 in. square. The whole is then weighed by the foreman, and the weight of the bullion, the quicksilver, and the water must then come up to within 1 lb. of the weight of the amalgam which was put in the retort. If the loss exceeds 1 lb. the cause of the excess must be discovered before the bullion leaves this place. Although half a ton of bullion per day is turned out the loss is frequently less than 1 lb. on a charge. After being cut and weighed the bottom is sent to the assay office in sacks, and re-weighed, in order to ensure accuracy. Owing to local circumstances the retorts do not last so long here as at the Consolidated Virginia Mill—their average life being about nine months. They have twelve retorts here, and work four a-day; therefore, each retort has a rest of nearly 48 hours between charges, except on clean-up days, when they clean up from 1½ to 1¾ ton of bullion. The lifetime of a retort may be said to be from 40 to 80, and even 100 charges; but the average will hardly go above 60. These retorts are somewhat expensive affairs, because once they are cracked they are of no use whatever, not even for old iron. The only use known for them is to fill up holes in the road as so much earth, or to plant them on street corners. They cost on an average \$4 a pound, weigh about 2000 lbs., and sometimes crack after a very few charges have been worked. Mr. Armstrong is making an experiment, however, that he thinks will be a success, and reduce their expense in this connection very materially. He has fitted up the furnace here with a top fire, so as to heat the retorts equally in all parts, and thus prevent their cracking from unequal expansion. The other furnaces cannot have a top fire; they can only have one under the retorts, and that is what causes the latter to crack.

* "The Epoch of the Mammoth, and the Apparition of Man upon the Earth." By JAMES C. SOUTHWALL, A.M., LL.D. London: Trübner and Co., Ludgate Hill.



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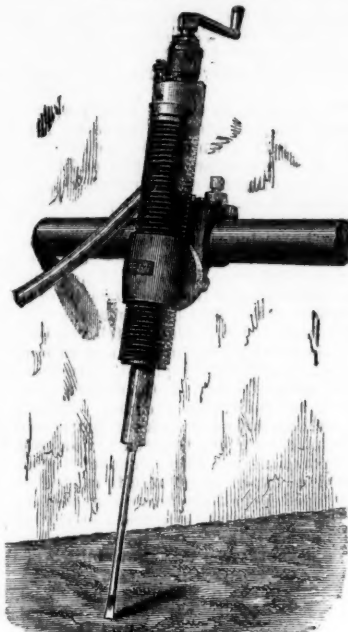
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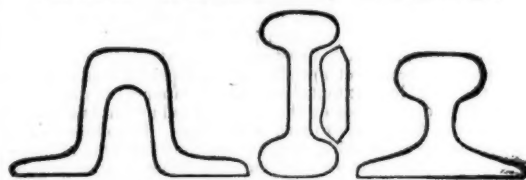
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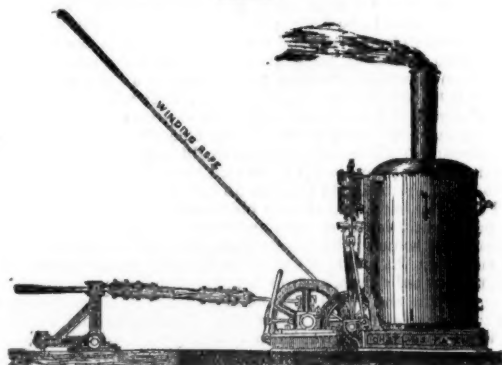
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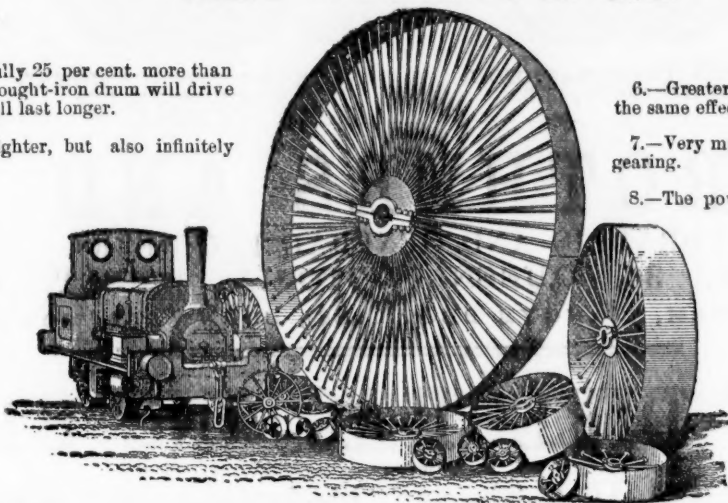
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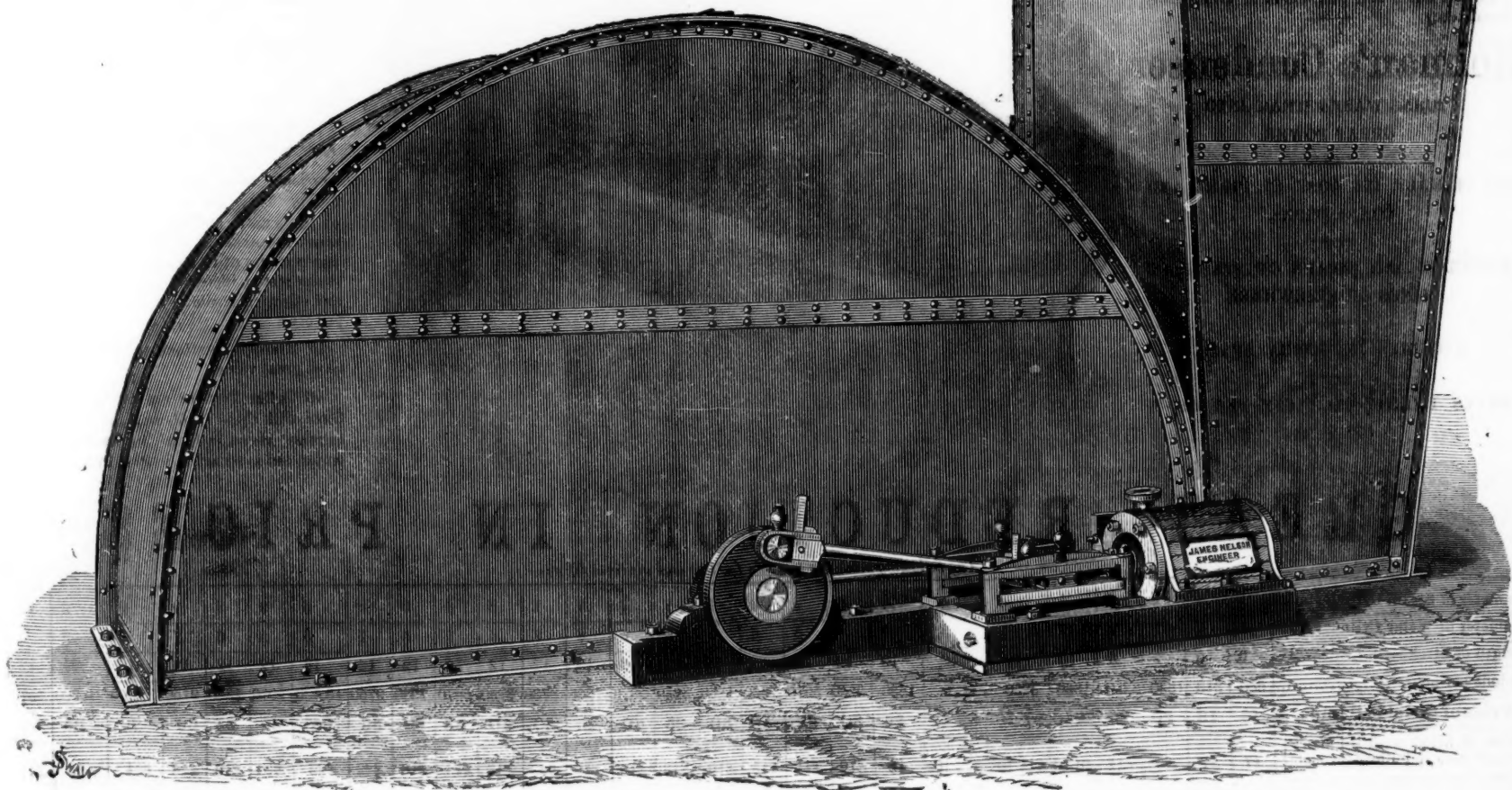
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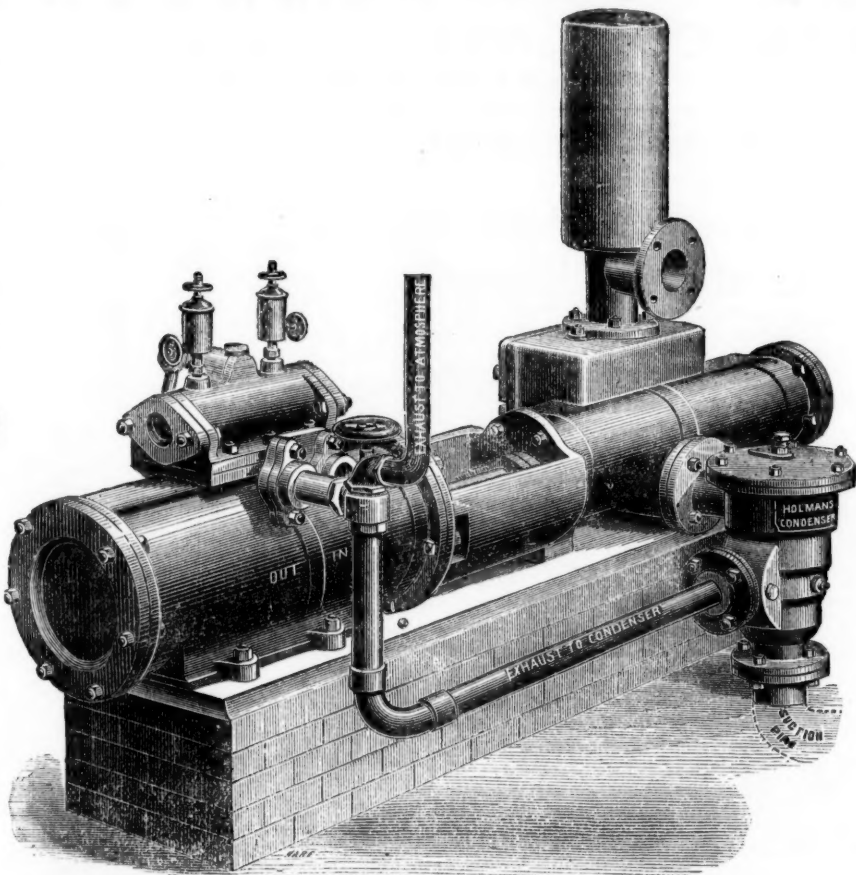
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Diameter of Steam Cylinder...In.	3	4	4	4	5	5	5	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10
Diameter of Water Cylinder...In.	1½	2	3	4	3	4	5	3	4	5	6	3	4	5	6	7	4	5	6	7	8	5	6	7	8	9	5	6
Length of Stroke.....In.	9	9	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	18	12	12	12	18	24	12	12
Gallons per hour	680	815	1830	3250	1830	3250	5070	1830	3250	5070	7330	1830	3250	5070	7330	9750	3250	5070	7330	9750	13,000	5070	7330	9750	13,000	16,500	5070	7330
Price of Special Pump...£	16	18	20	25	22 10	27 10	32 10	25	30	35	40	30	35	40	45	50	40	45	50	55	65	50	55	60	70	85	55	60
Extra, if fitted with Holman's Condenser and Blow-through Valve	£7	£7	£9	£11	£8 10	£11 10s	£12 10s	£9	£12	£15	£15	£10	£13	£15	£16	£22	£13	£16	£16	£22	£22	£16	£16	£23	£24	£35	£17	£17

CONTINUED.

Diameter of Steam Cylinder..In.	10	10	10	10	12	12	12	12	12	12	14	14	14	14	14	14	16	16	16	16	16	18	18	18	18
Diameter of Water Cylinder..In	7	8	9	10	6	7	8	9	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12	14
Length of StrokeIn	12	18	24	24	18	18	18	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Gallons per hour	9750	13,000	16,519	20,000	7330	9750	13,000	16,519	20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000
Price of Special Pump..£	65	75	90	100	75	80	85	110	120	140	110	120	130	140	160	180	140	150	160	180	200	180	190	210	230
Extra, if fitted with Holman's Condenser and Blow-through Valve	£23	£24	£35	£35	£20	£27	£27	£38	£38	£50	£28	£28	£40	£40	£55	£55	£28	40	£40	£55	£55	£45	£45	£56	£60

Intending purchasers of Steam Pumps would do well to observe the great length of stroke, short steam cylinder, and short piston of the "Special" Steam Pump, as compared with the short stroke, long steam cylinder, and long piston of the Pumps of other makers, as the efficiency and durability of the machine, and the space occupied by same, greatly depend upon this. The advantage of long strokes will be obvious when purchasers are reminded that each set of suction and delivery valves of a "Special" Steam Pump with 24 in. stroke, running at 120 ft. per minute, would open and close only 30 times per minute, as against 120 times per minute in a Pump with only 6 in. stroke performing same duty.

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HUNDREDS of these PUMPS are USED for HIGH LIFTS IN MINES, for which purpose they are made with 21, 24, 26, 28, 30, and 32-inch Steam Cylinders, and 36 48 and 72-inch Strokes

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GENTLEMEN,—I have great pleasure in recording my entire satisfaction with the working of the Holman's Patent Steam Pump Condenser which you have supplied to us. The complete condensation of the steam is, apart from its value in the strict economy of use, a most valuable feature in the drainage of underground work-

ings. The perfect manner in which this important result is accomplished by your Condenser is extremely creditable to you, and merits the thanks and commendation of the Mining Engineer. When we start the "Special" Steam Pump the Condenser commences working automatically, and maintains a constant vacuum of 10½ lbs. per square inch, even when we run the Pump upwards of 50 strokes (106 feet) per minute. It may perhaps be interesting to you to know that when we were running the Pump at 54 strokes (168 feet) per minute, the steam gauge

indicating a steam pressure of 36 lbs. per square inch, 80 yards from the Pump, and the Condenser vacuum gauge on the exhaust pipe indicating a steady vacuum of 21½ inches, I turned the exhaust steam from the Condenser into the atmosphere, when the speed at once fell to 44 strokes per minute. The working economy thus shown is really so great that the cost of the Condenser must be saved in a very short time. (Signed) J. THOMPSON.

NORTH OF ENGLAND HOUSE ...
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HADFIELD'S STEEL FOUNDRY COMPANY, ATTERCLIFFE, SHEFFIELD,

DEVOTE THEIR EXCLUSIVE ATTENTION TO THE MANUFACTURE OF

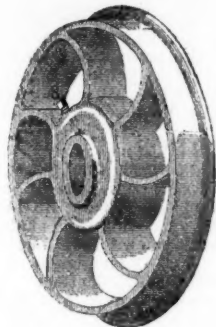
CRUCIBLE STEEL CASTINGS, for Engineering and Mining Purposes,

AND ARE THE SOLE MAKERS OF

Hadfield's Self-oiling Steel Wheels (PATENTED).

These possess advantages held by no other wheels, and are specially adapted for Collieries, Ironstone Mines, Slate Quarries, Lead and Copper Mines, &c., &c., where LOOSE Wheels are used (i. e., those revolving upon their own axles). By the old system of lubricating loose wheels, it is well known this is attended with constant labour and excessive waste; and as so little of the grease or oil applied reaches the wearing surfaces, and as re-greasing can only take place at fixed parts of the workings, the bosses of the wheels and bearings of the axles soon become dry, and cut each other: thus causing enormous wear and tear, and necessitating extra labour, haulage power, and expense. These and numerous other defects are entirely remedied by these wheels, as will be readily seen from the following illustrations and advantages claimed.

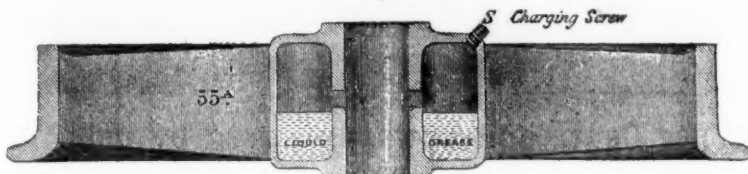
N.B.—Price per Set of Wheels and Axles (ready for use) forwarded on receipt of—1. Diameter of Wheel on tread. 2. Width of tread. 3. Diameter and total length of axle, also whether No. 74 or 75. 4. Rail gauge. 5. Rolling load.



55A



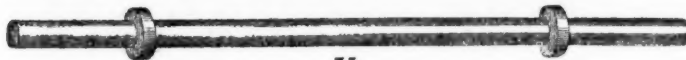
66A Registered



Section



74



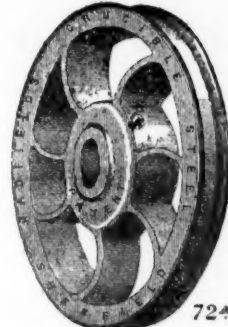
75



54A



34B



72A



35A

This Advertisement is varied from time to time.

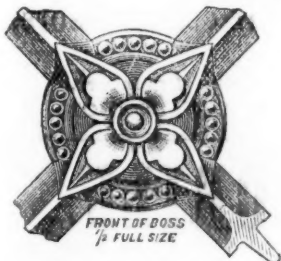
[This Sheet of Drawings is Copyright.]

The following are a few of the numerous Advantages claimed by the above Self-oiling Wheels:—

- 1.—Two-thirds (at least) less grease or oil is required than at present used by any known method of lubricating Mining Wagons, whether by hand, machine, or otherwise.
- 2.—These wheels effect a very great saving in haulage power; also wear and tear—being so constructed as never to allow the bearings to become dry. The revolving of the wheel leads out the oil as required, and immediately the wagon stops the lubricator ceases its action.
- 3.—No waste of grease can occur, no matter in what position the wagon may be placed, when discharging its contents (even if up side down); and when the wagons are not in use it is utterly impossible for any grease to escape, as it is all stored below the outlet (as shown above).
- 4.—When once these wheels have been charged with liquid grease (which can be done by any inexperienced person) they do not require any attention or re-greasing whatever for several weeks or even months afterwards, in proportion to the distance travelled.
- 5.—These wheels can be readily fixed to any description of either wood or iron curves now in use, whether the wheels are upon the inside or outside of the frame.
- 6.—They are exceedingly simple in construction, have no detail, and are not liable to get out of order.
- 7.—They possess great strength, durability, and extreme lightness, being made of CRUCIBLE STEEL.

Where FAST Wheels and Axles are adopted instead of Loose ones, as shown above, see our Illustrated Sheets of Drawings Nos. 2 and 3 of Crucible Steel Wheels and Axles, fitted complete by Hadfield's Patent Method, and Hadfield's Self-oiling Pedestals.

HARRIS'S PATENT WROUGHT-IRON WINDOWS. DOME AND OTHER ROOF LIGHTS, FLOOR AND PAVEMENT LIGHTS, ETC.

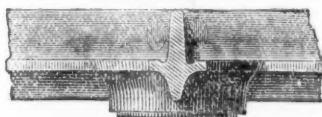


FRONT OF BOSS
1/4 FULL SIZE

GREAT BRITAIN,
UNITED STATES OF AMERICA,

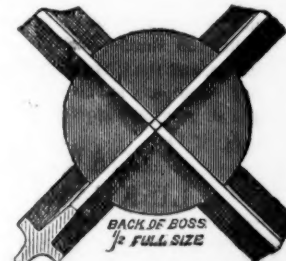
ARE STRONGER, SUPERIOR, AND CHEAPER
THAN ANY OTHER METAL SASHES YET
PRODUCED—COST LESS FOR GLAZING—
ARE AS CHEAP IN MANY CASES AS WOOD

PATENTED IN



FRANCE,
GERMANY, AND BELGIUM.

—CAN BE DESIGNED AND MANUFACTURED
TO SUIT ANY STYLE OF ARCHITECTURE
OR POSITION WHERE A WINDOW MAY BE
REQUIRED.
ARE BEING EXTENSIVELY USED IN—



BACK OF BOSS
1/2 FULL SIZE

Private Houses,
Parsonage Houses,
Farm Houses,
Churches,
Chapels,
Schools,

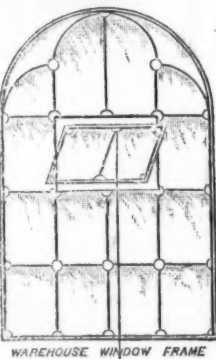
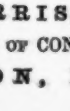
ILLUSTRATED CATALOGUES
ON APPLICATION.

In Basement Storeys and Exposed Positions Shutters
and Guard Bars are dispensed with.

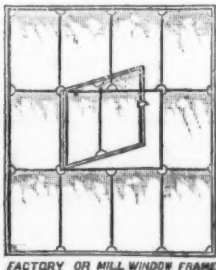
HOME AND

SOLE MAKER—J. T. HARRIS, Engineer, Ironfounder, and Manufacturer,

SAFE, STRONG ROOM, AND PARTY WALL DOORS, AND EVERY KIND OF CONSTRUCTIONAL AND BUILDERS' IRONWORK, LIFTS, HOISTS, ELECTRIC BELLS AND TELEGRAPHS, &c.
90, CANNON STREET, LONDON, E.C.; AND BEAUFORT IRONWORKS, BRISTOL.



WAREHOUSE WINDOW FRAME



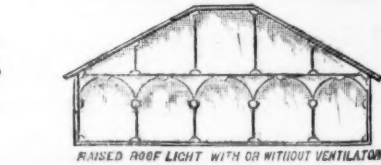
FACTORY OR MILL WINDOW FRAME

Lunatic Asylums, &c.,
Public Buildings, Banks,
Wharves, Warehouses,
Factories, Mills,
Breweries, &c.,
Engine Houses.

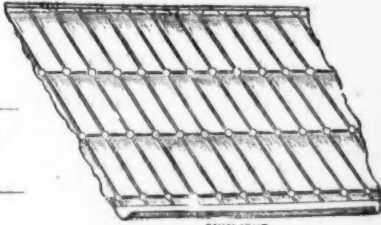
ILLUSTRATED CATALOGUES
ON APPLICATION.

Security is obtained in
these Skylights with-
out Guard Bars, and
with less obstruction
to Light.

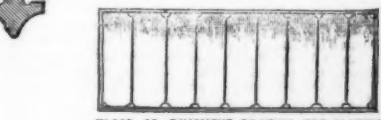
EXPORT.



RAISED ROOF LIGHT WITH OR WITHOUT VENTILATOR



SKYLIGHT



FLOOR OR PAVEMENT GRATING FOR GLAZING

H. R. MARSDEN, PATENTEE AND ONLY MAKER BLAKE MACHINES, OF THE WELL-KNOWN ORE CRUSHERS AND STONE BREAKERS,

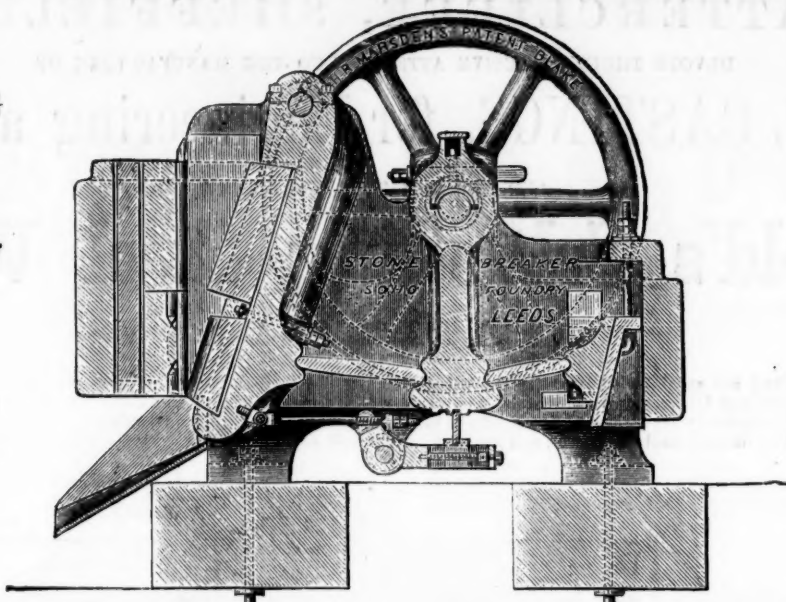
WITH THE
New Patent Reversible
CRUSHING OR CUBING
JAWS,

WHICH ARE CONSTRUCTED OF A PECULIAR
MIXTURE OF METAL, WEARING

Four times longer than any
other.

60 GOLD AND
SILVER MEDALS.

OVER 2000 NOW IN
USE.



For Crushing to any degree
of Fineness, or Breaking
to a required size.

Her Majesty's Government
USE THESE MACHINES
EXCLUSIVELY,
ALSO ALL THE GREAT
Mining Companies of the
World.

H. R. M. has long observed the want of cheaper
machines,
STONE AND ORE CRUSHERS,
And has at length, by means of improved appliances
for the production thereof, been enabled to reduce
the prices, yet keep up at the same time the well-
known strength of construction. Reduced prices
on application.

FIFTY per Cent., and upwards, saved by using these Machines.

TESTIMONIAL FROM MESSRS. JOHN TAYLOR AND SONS.

DEAR SIR,—We have adopted your Stone Breakers at many of the mines under our manage-
ment, and are pleased to be able to state that they have in all cases given the greatest satisfac-
tion. We are, yours faithfully,
H. R. Marsden, Esq.

6, Queen-street-place, May 10, 1877.

JOHN TAYLOR AND SONS.

DEAR SIR,—I have broken over 40,000 tons of very hard LIMESTONE into ROAD METAL, for
the Newport and other Road Trusts, in your PATENT STONE BREAKER, AND ALL WITH
ONE PAIR OF JAWS, which are STILL IN USE. I do not think at all, but am quite sure yours
are the only Machines which fully perform the work you set them out to do, and there are none
in the Show can at all compare with them. Yours, truly,
H. R. Marsden, Esq.

WILLIAM PRICE, Contractor, Gold Cliff, Monmouth.

Royal Agricultural Show, Liverpool, July, 1877.

ILLUSTRATED CATALOGUES, TESTIMONIALS, and every information, on application to:—

H. R. MARSDEN, SOHO FOUNDRY, LEEDS, ENGLAND.
ONLY MAKER OF SAULT'S PATENT SYPHON CONDENSER.

TO COLLIERY AND MINE OWNERS. R. HUDSON'S PATENT STEEL CORVES OR "TRAMS."

Patented July, 1875, and January, 1877.

Entire new principle, saving three-quarters to 2 cwt. "dead" weight per corve. Will hold 2 to 3 cwt. more coal than the ordinary kind, without increasing the outside dimensions. Adopted by—
Messrs. THOMPSON, WISE, & Co., Burry Port, South Wales.
Messrs. DYMOND'S Liversedge Coal Company, near Leeds.
Messrs. W. ACKROYD and Bros., Morley, near Leeds.
Messrs. CLAYTON and SPEIGHT, Farnley, near Leeds.
Messrs. JAS. WORMALD and SONS, Rawdon, near Leeds.
KINGSWOOD COAL and IRON CO., near Bristol.
MIDDLETON COLLIERY CO., near Leeds. | NEWTON COLLIERY, near Castleford. | Messrs. RUSHFORTH and Co., Adwalton, near Leeds. | Messrs. JAS. FUSSELL, SONS, and Co., Frome, Somersetshire.

Messrs. BARING, GOULD, & ATKINSON, Diamond Fields, South Africa.

Messrs. KIMBERLEY, Diamond Mines, South Africa.
Mr. HASELDEN'S Lead Mines, Linares, Spain.

FRYSTON COLLIERY CO. (Limited), Castleford, near Leeds.

HOWDEN CLOUGH COLLIERY CO. (Limited), near Leeds.

T. VAUGHAN and Co.'s TRUSTEES, South Medomsley Colliery; and others.

R. HUDSON, Engineer and Ironfounder, Gildersome Street Foundry, near Leeds (Five minutes walk from Gildersome Station, G.N.R.)

The Barrow Rock Drill COMPANY

Are NOW PREPARED to SUPPLY their DRILLS, the ONLY
ONES that have been SUCCESSFULLY WORKED in the
MINES of CORNWALL. At DOLCOATH MINE, in the
HARDEST known ROCK, a SINGLE MACHINE has, since
its introduction in July, 1876, driven MORE THAN THREE
TIMES the SPEED of HAND LABOUR, and at TWENTY PER
CENT. LESS COST PER FATHOM.

In ordinary ends two machines may be worked together,
and at a proportionately increased speed. They are strong,
light, and simple, easily worked, and adapted for ends and
stopes, and the sinking of winzes and shafts.

The company are also prepared to SUPPLY COMPRESSORS,
and all necessary appliances for working the said Drills.

Apply to—

LOAM AND SON,
LISKEARD, CORNWALL.

IMPROVED STEEL WIRE FOR ROPES.

WEBSTER & HORSFALL,
(ORIGINAL PATENTEES),

MANUFACTURERS OF IMPROVED STEEL WIRE FOR ROPES
FOR COLLIERIES,

RAILWAY INCLINES, PLOUGHS, HAWSERS, &c.

SOLE MANUFACTURERS of the HOMOGENEOUS WIRE for the
ATLANTIC CABLES of 1865 and 1866.

WEBSTER AND HORSFALL,
BIRMINGHAM.

THE GREAT ADVERTISING MEDIUM FOR WALES.

THE SOUTH WALES EVENING TELEGRAM
(DAILY), and
SOUTH WALES GAZETTE
(WEEKLY), established 1857,

the largest and most widely circulated papers in Monmouthshire and South Wales
CHIEF OFFICES—NEWPORT, MON.; and at CARDIFF.

The "Evening Telegram" is published daily, the first edition at Three P.M., the
second edition at Five P.M. On Friday, the "Telegram" is combined with the
South Wales Weekly Gazette, and advertisements ordered for not less than six
consecutive insertions will be inserted at a uniform charge in both papers.
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THE IRON AND COAL TRADES' REVIEW.
The IRON AND COAL TRADES' REVIEW is extensively circulated amongst the
Iron Producers, Manufacturers, and Consumers, Coalowners, &c., in all the iron
and coal districts. It is, therefore, one of the leading organs for advertising every
description of Iron Manufactures, Machinery, New Inventions, and all matters
relating to the Iron, Coal, Hardware, Engineering, and Metal Trades in general.
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Remittances payable to W. T. Pringle.

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STANDS UNRIVALLED

For Tunnels, Mines, Quarries, Harbour Works, Cutting
Blocks of Granite, &c.

The working parts are made of the toughest steel and phosphor-bronze—steel castings are also used—so
as to combine strength with light weight.

AIR-COMPRESSING MACHINERY
Of the simplest and best construction.

Combined Water-pressure Engines and Air-compressors,
Giving most excellent results.



ULLATHORNE AND CO., 63, QUEEN VICTORIA STREET, LONDON, E.C.

THE ROANHEAD ROCK DRILL. BY ROYAL LETTERS PATENT.

This justly-celebrated Rock Drill, the only one invented that will
work in the hardest rock without more than the usual repairs re-
quired by any ordinary machinery, is now offered to the public.

It has been most successfully worked in the well-known Hematite Mines of Lancashire and Cumberland. Will drive 50 to 60 ft.
in hard rock without change of drill, and can be worked by any miner, and kept in repair by any blacksmith. It is the most
simple rock drill ever invented, and cannot with fair usage get out of order.

Plans, Estimates, including Compressors, and all other Mining Machinery, supplied on application to the sole makers,—

SALMON BARNES AND CO.,
MINING ENGINEERS.

Canal Head Foundry and Engineering Works, Ulverston.

J. WOOD ASTON AND CO., STOURBRIDGE
(WORKS AND OFFICES ADJOINING CRADLEY STATION),

Manufacturers of

CRANE, INCLINE, AND PIT CHAINS,
Also CHAIN CABLES, ANCHORS, and RIGGING CHAINS, IRON and STEEL SHOVELS, SPADES
FORKS, ANVILS, VICES, SCYTHES, HAY and CHAFF KNIVES, PICKS, HAMMERS, NAILS,
RAILWAY and MINING TOOLS, FRYING PANS, BOWLS, LADLES, &c., &c.
Orab Winches, Pulley and Shatch Blocks, Screw and Lifting Jacks, Ship Knees, Forgings, and Use Iron of all descriptions,
STOURBRIDGE FIRE BRICKS AND CLAY.